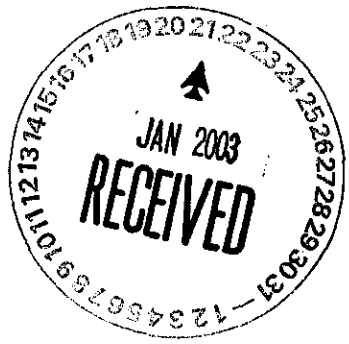
EBERLINE SERVICES

0058767

January 20, 2003



Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R2-11-088-7396, SDG H1977

Dear Mr. Trent:

Enclosed is the data report for one solid sample designated under SAF No. F03-005 received at Eberline Services on November 19, 2002. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

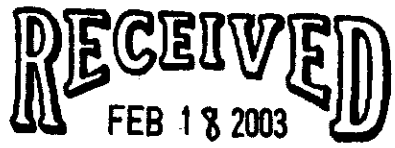
Sincerely,

Melissa Mannion

Melissa C. Mannion
Program Manager

MCM

Enclosure: Data Package



EDMC

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
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www.eberlineservices.com

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H1977 was composed of one solid (soil) sample designated under SAF No. F03-005 with a Project Designations of: 200 Area Source Characterization 200-CS-1 OU – Waste Man.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.5 Isotopic Uranium Analyses

Per FH's instructions, sample B15YL7 was not analyzed for isotopic uranium (see e-mail attached).

2.6 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.7 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.8 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.9 Transplutonic Analyses (Am-241, Cm-242, and Cm-243/244)

No problems were encountered during the course of the analyses.

2.10 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion — 1/20/3

Melissa C. Mannion
Program Manager

Date

Stephen_J_Trent@RL.gov
01/06/2003 01:08 PM

To: mmannion@eberlineservices.com
cc:
Subject: SDGs H1969, H1977, H1982, H1984, and H1996 total U

Melissa,

7391 ✓ 7396 ✓ 7399 ✓ 7401 ✓ 7414 ✓

We will not need to run isotopic U on SDGs SDGs H1969, H1977, H1982, H1984, and H1996.

Thanks,

Steve J. Trent
Sample Management Project Coordinator
Fluor Hanford - Central Plateau Project
Ph: (509) 373-5869
EFax: (866) 252-5816
Site Pager: 85-7344

E B E R L I N E S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP H1977

SDG	7396
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. 630
Case no	SDG H1977

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

SDG 7396
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H1977

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 01/20/03

SDG 7396
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H1977

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

SDG 7396
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1977

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B15YL7	SP-1	SOLID		R211088-01	F03-005	F03-005-011	11/14/02 09:39
Method Blank		SOLID		R211088-03	F03-005		
Method Blank		SOLID		R211088-06	F03-005		
Lab Control Sample		SOLID		R211088-02	F03-005		
Lab Control Sample		SOLID		R211088-05	F03-005		
Duplicate (R211088-01)	SP-1	SOLID		R211088-04	F03-005		11/14/02 09:39
Duplicate (R211088-01)	SP-1	SOLID		R211088-07	F03-005		11/14/02 09:39

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

SDG 7396
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1977

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7396	F03-005-011	B15YL7	SOLID	95.5	989.9 g		11/19/02	5	R211088-01	7396-001
		Method Blank	SOLID						R211088-03	7396-003
		Method Blank	SOLID						R211088-06	7396-006
		Lab Control Sample	SOLID						R211088-02	7396-002
		Lab Control Sample	SOLID						R211088-05	7396-005
		Duplicate (R211088-01)	SOLID	95.5	989.9 g		11/19/02	5	R211088-04	7396-004
		Duplicate (R211088-01)	SOLID		989.9 g		11/19/02	5	R211088-07	7396-007

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

SDG 7396
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1977

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
NP	SOLID	Neptunium in Soil	7052-079	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7052-079	5.0	1			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	7052-079	5.0	1			1	1	1/1		
TP	SOLID	Americium 241/Curium in Solids	7052-079	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7052-079	10.0	1			1	1	1/1		
Gas Proportional Counting												
93A	SOLID	Gross Alpha in Soil	7052-079	20.0	1			1	1	1/1		
93B	SOLID	Gross Beta in Soil	7052-079	15.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7052-079	15.0	1			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	7052-079	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	7052-079	10.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

SDG 7396
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1977

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUFFIX	ANALYZED	REVIEWED	BY	METHOD
B15YL7			R211088-01	7396-001	93A/93		01/06/03	01/20/03	MCM	Gross Alpha in Soil
SP-1		SOLID	11/14/02	7396-001	93B/93		01/06/03	01/20/03	MCM	Gross Beta in Soil
F03-005-011	F03-005		11/19/02	7396-001	C		12/23/02	01/20/03	MCM	Carbon 14 in Soil
				7396-001	GAM		01/09/03	01/20/03	MCM	Gamma Scan
				7396-001	NP		01/15/03	01/20/03	MCM	Neptunium in Soil
				7396-001	PU		01/15/03	01/20/03	MCM	Plutonium, Isotopic in Solids
				7396-001	SR		01/06/03	01/20/03	MCM	Total Strontium in Soil
				7396-001	TH		01/07/03	01/20/03	MCM	Thorium, Isotopic in Soil
				7396-001	TP		01/20/03	01/20/03	MCM	Americium 241/Curium in Solids
				7396-001	U_T		12/19/02	12/21/02	MCM	Uranium, Total in Soil
Method Blank			R211088-03	7396-003	93A/93		01/06/03	01/20/03	MCM	Gross Alpha in Soil
		SOLID		7396-003	93B/93		01/06/03	01/20/03	MCM	Gross Beta in Soil
	F03-005			7396-003	C		12/23/02	01/20/03	MCM	Carbon 14 in Soil
				7396-003	GAM		01/06/03	01/20/03	MCM	Gamma Scan
				7396-003	NP		01/15/03	01/20/03	MCM	Neptunium in Soil
				7396-003	PU		01/15/03	01/20/03	MCM	Plutonium, Isotopic in Solids
				7396-003	SR		01/06/03	01/20/03	MCM	Total Strontium in Soil
				7396-003	TH		01/07/03	01/20/03	MCM	Thorium, Isotopic in Soil
				7396-003	TP		01/17/03	01/20/03	MCM	Americium 241/Curium in Solids
Method Blank			R211088-06	7396-006	U_T		12/19/02	12/21/02	MCM	Uranium, Total in Soil
		SOLID								
	F03-005									
Lab Control Sample			R211088-02	7396-002	93A/93		01/07/03	01/20/03	MCM	Gross Alpha in Soil
		SOLID		7396-002	93B/93		01/07/03	01/20/03	MCM	Gross Beta in Soil
	F03-005			7396-002	C		12/24/02	01/20/03	MCM	Carbon 14 in Soil
				7396-002	GAM		01/06/03	01/20/03	MCM	Gamma Scan
				7396-002	NP		01/15/03	01/20/03	MCM	Neptunium in Soil
				7396-002	PU		01/17/03	01/20/03	MCM	Plutonium, Isotopic in Solids
				7396-002	SR		01/06/03	01/20/03	MCM	Total Strontium in Soil
				7396-002	TH		01/07/03	01/20/03	MCM	Thorium, Isotopic in Soil
				7396-002	TP		01/17/03	01/20/03	MCM	Americium 241/Curium in Solids
Lab Control Sample			R211088-05	7396-005	U_T		12/19/02	12/21/02	MCM	Uranium, Total in Soil
		SOLID								
	F03-005									

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

SDG 7396
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1977

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (R211088-01)			R211088-04	7396-004	93A/93		01/06/03	01/20/03	MCM	Gross Alpha in Soil
SP-1		SOLID	11/14/02	7396-004	93B/93		01/06/03	01/20/03	MCM	Gross Beta in Soil
	F03-005		11/19/02	7396-004	C		12/24/02	01/20/03	MCM	Carbon 14 in Soil
				7396-004	GAM		01/07/03	01/20/03	MCM	Gamma Scan
				7396-004	NP		01/15/03	01/20/03	MCM	Neptunium in Soil
				7396-004	PU		01/15/03	01/20/03	MCM	Plutonium, Isotopic in Solids
				7396-004	SR		01/06/03	01/20/03	MCM	Total Strontium in Soil
				7396-004	TH		01/07/03	01/20/03	MCM	Thorium, Isotopic in Soil
				7396-004	TP		01/17/03	01/20/03	MCM	Americium 241/Curium in Solids
Duplicate (R211088-01)			R211088-07	7396-007	U_T		12/19/02	12/21/02	MCM	Uranium, Total in Soil
SP-1		SOLID	11/14/02							
	F03-005		11/19/02							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
93A/93	F03-005	Gross Alpha in Soil	900.0_ALPHABETA_GPC	1			1	1	1	4
93B/93	F03-005	Gross Beta in Soil	900.0_ALPHABETA_GPC	1			1	1	1	4
C	F03-005	Carbon 14 in Soil	C14_COX_LSC	1			1	1	1	4
GAM	F03-005	Gamma Scan	GAMMA_GS	1			1	1	1	4
NP	F03-005	Neptunium in Soil	NP237_LLE_PLATE_AEA	1			1	1	1	4
PU	F03-005	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SR	F03-005	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TH	F03-005	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1			1	1	1	4
TP	F03-005	Americium 241/Curium in Solids	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
U_T	F03-005	Uranium, Total in Soil	UTOT_KPA	1			1	1	1	4
TOTALS				10			10	10	10	40

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

R211088-03 **Method Blank**

METHOD BLANK

SDG 7396 Client/Case no Hanford SDG H1977
Contact Melissa C. Mannion Contract No. 630

Lab sample id R211088-03 Client sample id Method Blank
Dept sample id 7396-003 Material/Matrix SOLID
SAF No F03-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.368	0.95	2.3	10	U	93A
Gross Beta	12587-47-2	-0.624	3.1	5.5	15	U	93B
Carbon 14	14762-75-5	-2.15	1.8	3.1	50	U	C
Total Strontium	SR-RAD	-0.145	0.16	0.37	1.0	U	SR
Thorium 228	14274-82-9	0.037	0.15	0.28		U	TH
Thorium 230	14269-63-7	0.183	0.22	0.28	1.0	U	TH
Thorium 232	TH-232	0	0.073	0.28	1.0	U	TH
Neptunium 237	13994-20-2	-0.033	0.13	0.31	1.0	U	NP
Plutonium 238	13981-16-3	0.062	0.18	0.34	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.031	0.12	0.29	1.0	U	PU
Curium 242	15510-73-3	0	0.026	0.057		U	TP
Curium 243/244	CM-243/244	0.021	0.043	0.075	1.0	U	TP
Americium 241	14596-10-2	0.047	0.051	0.075	1.0	U	TP
Sodium 22	13966-32-0	U		0.014		U	GAM
Potassium 40	13966-00-2	U		0.16		U	GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Antimony 125	14234-35-6	U		0.028		U	GAM
Tin 126	15832-50-5	U		0.017		U	GAM
Barium 133	13981-41-4	U		0.014		U	GAM
Cesium 134	13967-70-9	U		0.016		U	GAM
Cesium 137	10045-97-3	U		0.010	0.10	U	GAM
Radium 226	13982-63-3	U		0.022		U	GAM
Radium 228	15262-20-1	U		0.047		U	GAM
Europium 152	14683-23-9	U		0.034	0.10	U	GAM
Europium 154	15585-10-1	U		0.043	0.10	U	GAM
Europium 155	14391-16-3	U		0.027	0.10	U	GAM
Thorium 228	14274-82-9	U		0.016		U	GAM
Thorium 232	TH-232	U		0.047		U	GAM
Uranium 235	15117-96-1	U		0.036		U	GAM

200 Area Source Chara. 200-CS-1 OU

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 01/20/03

R211088-03 **Method Blank**

BLANK, cont.

SDG 7396 Client/Case no Hanford SDG H1977
Contact Melissa C. Mannion Contract No. 630

Lab sample id R211088-03 Client sample id Method Blank
Dept sample id 7396-003 Material/Matrix SOLID
SAF No F03-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 238	U-238	U		1.4		U	GAM
Americium 241	14596-10-2	U		0.037		U	GAM

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 43470

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 01/20/03

R211088-06 Method Blank

METHOD BLANK

SDG	7396	Client/Case no	Hanford SDG H1977
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R211088-06	Client sample id	Method Blank
Dept sample id	7396-006	Material/Matrix	SOLID
		SAF No	F03-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Uranium (ug/g)	7440-61-1	0	0.002	0.005	0.10	U	U_T

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 43431

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

R211088-02 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7396 Client/Case no Hanford SDG H1977

Contact Melissa C. Mannion Contract No. 630

Lab sample id R211088-02 Client sample id Lab Control Sample

Dept sample id 7396-002 Material/Matrix SOLID

SAF No F03-005

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	197	14	3.5	10		93A	200	8.0	98	68-132	70-130
Gross Beta	207	11	6.5	15		93B	212	8.5	98	76-124	70-130
Carbon 14	1830	19	4.3	50		C	1910	76	96	84-116	80-120
Total Strontium	22.4	1.2	0.37	1.0		SR	21.2	0.85	106	81-119	80-120
Thorium 230	47.0	9.6	1.2	1.0		TH	40.8	1.6	115	63-137	80-120
Neptunium 237	17.6	2.0	0.36	1.0		NP	19.9	0.80	88	82-118	80-120
Plutonium 238	22.8	2.3	0.21	1.0		PU	24.4	0.98	93	83-117	80-120
Plutonium 239/240	25.9	2.6	0.21	1.0		PU	26.4	1.1	98	82-118	80-120
Curium 243/244	19.2	0.87	0.11	1.0		TP	18.8	0.75	102	88-112	80-120
Americium 241	18.5	0.85	0.10	1.0		TP	19.1	0.76	97	88-112	80-120
Cobalt 60	1.06	0.075	0.030	0.050		GAM	0.994	0.040	107	73-127	80-120
Cesium 137	1.42	0.074	0.045	0.10		GAM	1.30	0.052	109	73-127	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 43469

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

R211088-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7396 | Client/Case no Hanford | SDG H1977

Contact Melissa C. Mannion | Contract No. 630

Lab sample id R211088-05 | Client sample id Lab Control Sample

Dept sample id 7396-005 | Material/Matrix SOLID

SAF No F03-005

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Uranium (ug/g)	13.6	1.5	0.045	0.10		U_T	13.2	0.53	103	77-123	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 43430

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

R211088-04 B15YL7

DUPLICATE

SDG 7396 Client/Case no Hanford SDG H1977

Contact Melissa C. Mannion Contract No. 630

DUPLICATE		ORIGINAL			
Lab sample id	R211088-04	Lab sample id	R211088-01	Client sample id	B15YL7
Dept sample id	7396-004	Dept sample id	7396-001	Location/Matrix	SP-1 SOLID
		Received	11/19/02	Collected/Weight	11/14/02 09:39 989.9 g
% solids	95.5	% solids	95.5	Custody/SAF No	F03-005-011 F03-005

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	3.41	2.5	2.9	10		93A	4.22	2.7	2.9		21	151
Gross Beta	14.3	4.4	6.3	15		93B	16.0	4.0	5.2		11	67
Carbon 14	-1.35	1.7	2.8	50	U	C	-0.674	1.8	3.0	U	-	
Total Strontium	0.963	0.21	0.24	1.0		SR	0.895	0.21	0.25		7	52
Thorium 228	0.228	0.23	0.29		U	TH	0.270	0.23	0.29	U	-	
Thorium 230	0.190	0.23	0.29	1.0	U	TH	0.154	0.15	0.29	U	-	
Thorium 232	0.152	0.15	0.29	1.0	U	TH	0.192	0.15	0.29	U	-	
Neptunium 237	0.060	0.060	0.089	1.0	U	NP	0	0.12	0.32	U	-	
Plutonium 238	0	0.14	0.33	1.0	U	PU	0	0.066	0.25	U	-	
Plutonium 239/240	0.311	0.21	0.26	1.0		PU	0.265	0.20	0.25		16	151
Curium 242	-0.006	0.024	0.057		U	TP	0	0.10	0.39	U	-	
Curium 243/244	0.036	0.045	0.077	1.0	U	TP	0	0.077	0.29	U	-	
Americium 241	0.018	0.036	0.043	1.0	U	TP	0.153	0.15	0.29	U	-	
Sodium 22	U		0.049		U	GAM	U		0.040	U	-	
Potassium 40	12.3	0.65	0.32			GAM	11.6	0.38	0.20		6	33
Cobalt 60	U		0.042	0.050	U	GAM	U		0.018	U	-	
Antimony 125	U		0.085		U	GAM	U		0.040	U	-	
Tin 126	U		0.21		U	GAM	U		0.035	U	-	
Barium 133	U		0.047		U	GAM	U		0.017	U	-	
Cesium 134	U		0.055		U	GAM	U		0.023	U	-	
Cesium 137	0.288	0.038	0.036	0.10		GAM	0.312	0.022	0.021		8	39
Radium 226	0.493	0.073	0.067			GAM	0.495	0.036	0.036		0	40
Radium 228	0.721	0.16	0.16			GAM	0.705	0.076	0.077		2	49
Europium 152	U		0.096	0.10	U	GAM	U		0.044	U	-	
Europium 154	U		0.14	0.10	U	GAM	U		0.058	U	-	
Europium 155	U		0.095	0.10	U	GAM	U		0.098	U	-	
Thorium 228	0.892	0.066	0.059			GAM	0.668	0.022	0.021		29	35
Thorium 232	0.721	0.16	0.16			GAM	0.705	0.076	0.077		2	49

200 Area Source Chara. 200-CS-1 OU

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/20/03

R211088-04 B15YL7

DUPLICATE, cont.

SDG 7396		Client/Case no Hanford	SDG H1977
Contact Melissa C. Mannion		Contract No. 630	
DUPLICATE	ORIGINAL		
Lab sample id R211088-04	Lab sample id R211088-01	Client sample id B15YL7	
Dept sample id 7396-004	Dept sample id 7396-001	Location/Matrix SP-1	SOLID
	Received 11/19/02	Collected/Weight 11/14/02 09:39	989.9 g
% solids 95.5	% solids 95.5	Custody/SAF No F03-005-011	F03-005

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Uranium 235	U		0.14		U	GAM	U		0.068	U	-	
Uranium 238	U		4.7		U	GAM	U		2.0	U	-	
Americium 241	U		0.14		U	GAM	U		0.062	U	-	

200 Area Source Chara. 200-CS-1 OU

QC-DUP#1 43471

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

R211088-07 B15YL7

DUPLICATE

SDG 7396 Client/Case no Hanford SDG H1977

Contact Melissa C. Mannion Contract No. 630

DUPLICATE		ORIGINAL			
Lab sample id	R211088-07	Lab sample id	R211088-01	Client sample id	B15YL7
Dept sample id	7396-007	Dept sample id	7396-001	Location/Matrix	SP-1 SOLID
		Received	11/19/02	Collected/Weight	11/14/02 09:39 989.9 g
		% solids	95.5	Custody/SAF No	F03-005-011 F03-005

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Total Uranium (ug/g)	0.573	0.064	0.005	0.10		U_T	0.562	0.063	0.005		2	30

200 Area Source Chara. 200-CS-1 OU

QC-DUP#1 43432

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/20/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1977

R211088-01 **B15YL7**

DATA SHEET

SDG	7396	Client/Case no	Hanford SDG H1977
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R211088-01	Client sample id	B15YL7
Dept sample id	7396-001	Location/Matrix	SP-1 SOLID
Received	11/19/02	Collected/Weight	11/14/02 09:39 989.9 g
% solids	95.5	Custody/SAF No	F03-005-011 F03-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	4.22	2.7	2.9	10		93A
Gross Beta	12587-47-2	16.0	4.0	5.2	15		93B
Carbon 14	14762-75-5	-0.674	1.8	3.0	50	U	C
Total Strontium	SR-RAD	0.895	0.21	0.25	1.0		SR
Thorium 228	14274-82-9	0.270	0.23	0.29		U	TH
Thorium 230	14269-63-7	0.154	0.15	0.29	1.0	U	TH
Thorium 232	TH-232	0.192	0.15	0.29	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0.562	0.063	0.005	0.10		U_T
Neptunium 237	13994-20-2	0	0.12	0.32	1.0	U	NP
Plutonium 238	13981-16-3	0	0.066	0.25	1.0	U	PU
Plutonium 239/240	PU-239/240	0.265	0.20	0.25	1.0		PU
Curium 242	15510-73-3	0	0.10	0.39		U	TP
Curium 243/244	CM-243/244	0	0.077	0.29	1.0	U	TP
Americium 241	14596-10-2	0.153	0.15	0.29	1.0	U	TP
Sodium 22	13966-32-0	U		0.040		U	GAM
Potassium 40	13966-00-2	11.6	0.38	0.20			GAM
Cobalt 60	10198-40-0	U		0.018	0.050	U	GAM
Antimony 125	14234-35-6	U		0.040		U	GAM
Tin 126	15832-50-5	U		0.035		U	GAM
Barium 133	13981-41-4	U		0.017		U	GAM
Cesium 134	13967-70-9	U		0.023		U	GAM
Cesium 137	10045-97-3	0.312	0.022	0.021	0.10		GAM
Radium 226	13982-63-3	0.495	0.036	0.036			GAM
Radium 228	15262-20-1	0.705	0.076	0.077			GAM
Europium 152	14683-23-9	U		0.044	0.10	U	GAM
Europium 154	15585-10-1	U		0.058	0.10	U	GAM
Europium 155	14391-16-3	U		0.098	0.10	U	GAM
Thorium 228	14274-82-9	0.668	0.022	0.021			GAM

200 Area Source Chara. 200-CS-1 OU

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/03

SDG	7396	Client/Case no	Hanford SDG H1977
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R211088-01	Client sample id	B15YL7
Dept sample id	7396-001	Location/Matrix	SP-1 SOLID
Received	11/19/02	Collected/Weight	11/14/02 09:39 989.9 g
% solids	95.5	Custody/SAF No	F03-005-011 F03-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Thorium 232	TH-232	0.705	0.076	0.077			GAM
Uranium 235	15117-96-1	U		0.068		U	GAM
Uranium 238	U-238	U		2.0		U	GAM
Americium 241	14596-10-2	U		0.062		U	GAM

200 Area Source Chara. 200-CS-1 OU

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

Test NP Matrix SOLID
SDG 7396
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1977

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237
Preparation batch 7052-079					
B15YL7	R211088-01			7396-001	U
BLK (QC ID=43470)	R211088-03			7396-003	U
LCS (QC ID=43469)	R211088-02			7396-002	ok
Duplicate (R211088-01)	R211088-04			7396-004	- U
Nominal values and limits from method				RDLs (pCi/g)	1.0
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 5.0 %			Reference Lab Notebook 7052 pg. 079												
B15YL7	R211088-01			0.32	0.500			81		137			62	01/14/03	01/15	SS-021
BLK (QC ID=43470)	R211088-03			0.31	0.500			67		138				01/14/03	01/15	SS-024
LCS (QC ID=43469)	R211088-02			0.36	0.500			64		137				01/14/03	01/15	SS-022
Duplicate (R211088-01) (QC ID=43471)	R211088-04			0.089	0.500			70		138			62	01/14/03	01/15	SS-039
Nominal values and limits from method				1.0	0.500		20-105			100			180			

PROCEDURES	REFERENCE	
	NP237_LLE_PLATE_AEA	
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-934	Neptunium from Solids and Water by Extraction Chromatography, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	0.27	± 0.24
	YIELD	70	± 15

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

Test PU Matrix SOLID
SDG 7396
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1977

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240
Preparation batch 7052-079							
B15YL7	R211088-01			7396-001	U		0.265
BLK (QC ID=43470)	R211088-03			7396-003	U		U
LCS (QC ID=43469)	R211088-02			7396-002	ok		ok
Duplicate (R211088-01)	R211088-04			7396-004	-	U	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0
200 Area Source Chara. 200-CS-1 OU							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079 2σ prep error 5.0 % Reference Lab Notebook 7052 pg. 079																
B15YL7	R211088-01			0.25	0.500			76	119				62	01/14/03	01/15	SS-016
BLK (QC ID=43470)	R211088-03			0.34	0.500			86	120					01/14/03	01/15	SS-021
LCS (QC ID=43469)	R211088-02			0.21	0.500			89	124					01/14/03	01/17	SS-051
Duplicate (R211088-01) (QC ID=43471)	R211088-04			0.33	0.500			79	120				62	01/14/03	01/15	SS-022
Nominal values and limits from method				1.0	0.500			20-105	100	100			180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.28 ± 0.13
YIELD 82 ± 12

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

Test TH Matrix SOLID
SDG 7396
Contact Melissa C. Mannion

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1977

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 230
Preparation batch 7052-079					
B15YL7	R211088-01			7396-001	U
BLK (QC ID=43470)	R211088-03			7396-003	U
LCS (QC ID=43469)	R211088-02			7396-002	ok
Duplicate (R211088-01)	R211088-04			7396-004	- U
Nominal values and limits from method				RDLs (pCi/g)	1.0
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 5.0 %			Reference Lab Notebook 7052 pg. 079												
B15YL7	R211088-01			0.29	0.250			98		156			54	01/06/03	01/07	SS-061
BLK (QC ID=43470)	R211088-03			0.28	0.250			103		156				01/06/03	01/07	SS-065
LCS (QC ID=43469)	R211088-02			1.2	0.250			26		156				01/06/03	01/07	SS-064
Duplicate (R211088-01) (QC ID=43471)	R211088-04			0.29	0.250			103		156			54	01/06/03	01/07	SS-066
Nominal values and limits from method				1.0	0.250			20-105		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-907	Thorium in Water and Dissolved Solid Samples by TEVA and Anion Exchange Column Method, rev 2
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.52 ± 0.91
YIELD 82 ± 75

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

Test TP Matrix SOLID
SDG 7396
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241/CURIUM IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1977

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Curium 243/244		Americium 241	
Preparation batch 7052-079								
B15YL7	R211088-01			7396-001	U		U	
BLK (QC ID=43470)	R211088-03			7396-003	U		U	
LCS (QC ID=43469)	R211088-02			7396-002	ok		ok	
Duplicate (R211088-01)	R211088-04			7396-004	-	U	-	U
Nominal values and limits from method 200 Area Source Chara. 200-CS-1 OU				RDLs (pCi/g)	1.0		1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079 2σ prep error 5.0 % Reference Lab Notebook 7052 pg. 079																
B15YL7	R211088-01			0.29	0.500			68		109			67	01/17/03	01/20	SS-055
BLK (QC ID=43470)	R211088-03			0.075	0.500			70		987				01/17/03	01/17	SS-024
LCS (QC ID=43469)	R211088-02			0.11	0.500			61		987				01/17/03	01/17	SS-022
Duplicate (R211088-01) (QC ID=43471)	R211088-04			0.077	0.500			69		991			64	01/17/03	01/17	SS-042
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	*Soil Dissolution, > 1.0g Aliquot, rev 2*
	CP-963	Americium and Curium in Water and Dissolved *Samples by Extraction Chromatography, rev 3*
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.14 ± 0.21
YIELD 67 ± 8

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

Test SR Matrix SOLID
SDG 7396
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1977

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 7052-079					
B15YL7	R211088-01			7396-001	0.895
BLK (QC ID=43470)	R211088-03			7396-003	U
LCS (QC ID=43469)	R211088-02			7396-002	ok
Duplicate (R211088-01)	R211088-04			7396-004	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 10.0 %	Reference Lab Notebook 7052 pg. 079														
B15YL7	R211088-01			0.25	1.00			90		100			53	01/06/03	01/06	GRB-218
BLK (QC ID=43470)	R211088-03			0.37	1.00			76		100				01/06/03	01/06	GRB-202
LCS (QC ID=43469)	R211088-02			0.37	1.00			84		60				01/06/03	01/06	GRB-202
Duplicate (R211088-01) (QC ID=43471)	R211088-04			0.24	1.00			94		100			53	01/06/03	01/06	GRB-220
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES	REFERENCE	
	SRTOT_SEP_PRECIP_GPC	
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-502	*Strontium in Solids, rev 6*

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	0.31	± 0.14
	YIELD	86	± 16

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

Test 93A Matrix SOLID
SDG 7396
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1977

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha
Preparation batch 7052-079					
B15YL7	R211088-01	93		7396-001	4.22
BLK (QC ID=43470)	R211088-03	93		7396-003	U
LCS (QC ID=43469)	R211088-02	93		7396-002	ok
Duplicate (R211088-01)	R211088-04	93		7396-004	ok
Nominal values and limits from method				RDLs (pCi/g)	10
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 20.0 %	Reference Lab Notebook 7052 pg. 079														
B15YL7	R211088-01	93		2.9	0.100			23		107			53	01/06/03	01/06	GRB-109
BLK (QC ID=43470)	R211088-03	93		2.3	0.100			20		107				01/06/03	01/06	GRB-111
LCS (QC ID=43469)	R211088-02	93		3.5	0.100			21		100				01/06/03	01/07	GRB-115
Duplicate (R211088-01) (QC ID=43471)	R211088-04	93		2.9	0.100			23		107			53	01/06/03	01/06	GRB-112
Nominal values and limits from method				10	0.100			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-125	Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD	MDA 2.9 ± 0.98
FOR 4 SAMPLES	RESIDUE 22 ± 3

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

Test 938 Matrix SOLID
SDG 7396
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1977

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta
Preparation batch 7052-079					
B15YL7	R211088-01	93		7396-001	16.0
BLK (QC ID=43470)	R211088-03	93		7396-003	U
LCS (QC ID=43469)	R211088-02	93		7396-002	ok
Duplicate (R211088-01)	R211088-04	93		7396-004	ok
Nominal values and limits from method				RDLs (pCi/g)	15
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 15.0 %			Reference Lab Notebook 7052 pg. 079												
B15YL7	R211088-01	93		5.2	0.100			23		107			53	01/06/03	01/06	GRB-109
BLK (QC ID=43470)	R211088-03	93		5.5	0.100			20		107				01/06/03	01/06	GRB-111
LCS (QC ID=43469)	R211088-02	93		6.5	0.100			21		100				01/06/03	01/07	GRB-115
Duplicate (R211088-01) (QC ID=43471)	R211088-04	93		6.3	0.100			23		107			53	01/06/03	01/06	GRB-112
Nominal values and limits from method				15	0.100			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-125	Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 5.9 ± 1.2
RESIDUE 22 ± 3

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/20/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

Test GAM Matrix SOLID
SDG 7396
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1977

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137
Preparation batch 7052-079							
B15YL7	R211088-01			7396-001	U		0.312
BLK (QC ID=43470)	R211088-03			7396-003	U		U
LCS (QC ID=43469)	R211088-02			7396-002	ok		ok
Duplicate (R211088-01)	R211088-04			7396-004	-	U	ok
Nominal values and limits from method 200 Area Source Chara. 200-CS-1 OU				RDLs (pCi/g)	0.050		0.10

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079 *2σ prep error 15.0 %* *Reference Lab Notebook 7052 pg. 079*																
B15YL7	R211088-01			0.16	719					784			56	01/02/03	01/09	02,03,00
BLK (QC ID=43470)	R211088-03			0.12	719					99				01/02/03	01/06	01,04,00
LCS (QC ID=43469)	R211088-02			0.030	719					101				01/02/03	01/06	MB,05,00
Duplicate (R211088-01) (QC ID=43471)	R211088-04			0.34	719					99			54	01/02/03	01/07	02,04,00
Nominal values and limits from method				0.050	719					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 4
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	0.16 ±	0.26
	YIELD	±	

Lab id EBRLNE
Protocol Hanford
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

Test U_T Matrix SOLID
SDG 7396
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client Hanford
Contract No. 630
Contract SDG H1977

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation batch 7052-079					
B15YL7	R211088-01			7396-001	0.562
BLK (QC ID=43431)	R211088-06			7396-006	U
LCS (QC ID=43430)	R211088-05			7396-005	ok
Duplicate (R211088-01)	R211088-07			7396-007	ok
Nominal values and limits from method				RDLs (ug/g)	0.10
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 9.0 %			Reference Lab Notebook 7052 pg. 079												
B15YL7	R211088-01			0.005	0.100								35	12/19/02	12/19	KPA-001
BLK (QC ID=43431)	R211088-06			0.005	0.100									12/19/02	12/19	KPA-001
LCS (QC ID=43430)	R211088-05			0.045	0.100									12/19/02	12/19	KPA-001
Duplicate (R211088-01) (QC ID=43432)	R211088-07			0.005	0.100								35	12/19/02	12/19	KPA-001
Nominal values and limits from method				0.10	0.100								180			

PROCEDURES	REFERENCE	UTOT_KPA
	CP-060	Soil Preparation, rev 4
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 5
	CP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 4
	CP-928	Total Uranium by Kinetic Phosphorimetry, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.015 ± 0.040
YIELD ____ ± ____

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1977

Test C Matrix SOLID
SDG 7396
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1977

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 7052-079						
B15YL7	R211088-01			7396-001	U	
BLK (QC ID=43470)	R211088-03			7396-003	U	
LCS (QC ID=43469)	R211088-02			7396-002	ok	
Duplicate (R211088-01)	R211088-04			7396-004	-	U
Nominal values and limits from method				RDLs (pCi/g)	50	
200 Area Source Chara. 200-CS-1 OU						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7052-079	2σ prep error 10.0 %			Reference Lab Notebook 7052 pg. 079												
B15YL7	R211088-01			3.0	0.334			100		100			39	12/23/02	12/23	LSC-006
BLK (QC ID=43470)	R211088-03			3.1	0.334			100		100				12/23/02	12/23	LSC-006
LCS (QC ID=43469)	R211088-02			4.3	0.334			100		44				12/23/02	12/24	LSC-006
Duplicate (R211088-01) (QC ID=43471)	R211088-04			2.8	0.350			100		100			40	12/23/02	12/24	LSC-006
Nominal values and limits from method				50	0.334					50			180			

PROCEDURES REFERENCE C14_COX_LSC
CP-251 Tritium/Carbon-14 Oxidation, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 3.3 ± 1.4
YIELD 100 ± 0

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SAMPLE DELIVERY GROUP H1977

SDG 7396
Contact Melissa C. Mannion

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Client Hanford
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SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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Version 3.06
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Case no SDG H1977

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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SDG 7396
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Client Hanford
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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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REPORT GUIDE

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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REPORT GUIDE

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Contract No. 630
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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 01/20/03

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

SDG 7396
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H1977

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 01/20/03

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-011	Page 1 of 1

Collector R. Nielson	**Company Contact** Steve Trent **Telephone No.** 373-5869	**Project Coordinator** TRENT, SJ	**Price Code** 8N **Data Turnaround** 45 Days
Project Designation 200 Area Source Characterization 200-CS-1 OU - Waste Man	**Sampling Location** SP-1 H1977 (7396)	**SAF No.** F03-005	**Air Quality** ☐
Ice Chest No. ERC 96 035	**Field Logbook No.** HNF-N-3251 **COA** 117514ES10	**Method of Shipment** Federal Express	
Shipped To EBERLINE SERVICES (Formerly TMA)	**Offsite Property No.** A030051	**Bill of Lading/Air Bill No.** SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None RJN 11/13/02
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG
No. of Container(s)	1	1	1	1	1	1	1	1	1
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082 11/18/02	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - LS RJN 11/18/02

Sample No.	Matrix *	Sample Date	Sample Time									
B15YL7	SOIL	11-14-02	0939	X	X	X	X	X	X	X	X	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson	11-14-02 1320	REF # 1B/3728	11-14-02 1320
S JGALE	11/18/02 1100	S	
REF 1B	11/18/02 1100	S JGALE	11/18/02 1100
S JGALE	11/18/02 1100	FED EX	
FED EX	11/19/02 9:35		11/19/02 9:35

Sign/Print Names

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 – Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

Personnel not available to relinquish samples from the 3728 Ref # 1B on 11/18/02

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

EBERLINE SERVICES **ANALYTICAL SERVICES GROUP**

Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Fluor Hanford Date/Time received 11/19/02 9.35

CoC No. F03-005-011

Container I.D. No. ERC96035 Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [X]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [X]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [X]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [X]	No [ ]	N/A [ ]
5.	Packing material is:	Wet [ ]	Dry [X]	
6.	Number of samples in shipping container: 1			
7.	Number of containers per sample: 1 (Or see CoC)			
8.	Paperwork agrees with samples?	Yes [X]	No [ ]	
9.	Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]			
10.	Samples are: In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]			
11.	Describe any anomalies:			
13.	Was P.M. notified of any anomalies? Yes [ ] No [ ] Date			
14.	Received by Date: 11/19/02 Time: 9:35			

Customer Sample No.	cpm	mr/hr	wipe	Customer Sample No.	cpm	mr/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____

Alpha meter Ser. No. _____ Calibration date _____

Survey Meter Ser. No. _____ Calibration date _____

LIONVILLE LABORATORY INC.

27 December 2002

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Ave.
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0211L177
SDG #	H1977
SAF #	F03-005
Date Received	11-19-02
# Samples	1
Matrix	Soil
Volatiles	X
Semivolatiles	X
Pest/PCB	X
DRO/GRO	X
GC Scan	X
Metals	X
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

r:\group\pm\orlette\tnu-hanford\data\fc_ltrs.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

RFW LOT # :0211L177

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B15YL7	001	S	02LVX657	11/14/02	11/19/02	N/A	11/21/02
B15YL7	001 MS	S	02LVX657	11/14/02	11/19/02	N/A	11/21/02
B15YL7	001 MSD	S	02LVX657	11/14/02	11/19/02	N/A	11/21/02
LAB QC:							
VBLKZS	MB1	S	02LVX657	N/A	N/A	N/A	11/21/02
VBLKZS	MB1 BS	S	02LVX657	N/A	N/A	N/A	11/21/02

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD F03-005
LVL #: 0211L177
SDG/SAF #: H1977/F03-005

W.O. #: 11343-606-001-9999-00
Date Received: 11-19-2002

GC/MS VOLATILE

One (1) soil sample was collected on 11-14-2002.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for TCL volatile target compounds on 11-21-2002.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy with the exception of a discrepancy, which has been recorded on the Sample Receipt Checklist (p-11).

2. The required holding time for analysis was met.

3. Non-target compounds were not detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. All matrix spike recoveries were within EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than the CRQL.

8. Internal standard area and retention time criteria were met.

9. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

by S C D Welk

J. Michael Taylor
President
Lionville Laboratory Incorporated

12-13-02
Date

som\group\data\voa\tnu-hanford\0211-177.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF VOA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated *sample quantitation limit which is included and corrected for dilution and percent moisture.*

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

MP - Missed Peak: manually added peak not found by automatic quantitation program.

PA - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List

Report Date: 12/09/02 22:37

RFW Batch Number: 0211L177 Client: TNUHANFORD F03-005 H1977 Work Order: 11343606001 Page: 1a

	Cust ID:	B15YL7	B15YL7	B15YL7	VBLKZS	VBLKZS BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LVX657-MB1	02LVX657-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.11	1.06	0.980	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Toluene-d8	102 %	98 %	97 %	94 %	93 %
	Bromofluorobenzene	104 %	98 %	100 %	94 %	95 %
	1,2-Dichloroethane-d4	106 %	104 %	103 %	95 %	98 %
Chloromethane		12 U	11 U	10 U	10 U	10 U
Bromomethane		12 U	11 U	10 U	10 U	10 U
Vinyl Chloride		12 U	11 U	10 U	10 U	10 U
Chloroethane		12 U	11 U	10 U	10 U	10 U
Methylene Chloride		14 B	6 U	5 U	2 J	5 U
Acetone		12 U	11 U	10 U	10 U	10 U
Carbon Disulfide		6 U	6 U	5 U	5 U	5 U
1,1-Dichloroethene		6 U	92 %	94 %	5 U	91 %
1,1-Dichloroethane		6 U	6 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		6 U	6 U	5 U	5 U	5 U
Chloroform		6 U	6 U	5 U	5 U	5 U
1,2-Dichloroethane		6 U	6 U	5 U	5 U	5 U
2-Butanone		12 U	11 U	10 U	10 U	10 U
1,1,1-Trichloroethane		6 U	6 U	5 U	5 U	5 U
Carbon Tetrachloride		6 U	6 U	5 U	5 U	5 U
Bromodichloromethane		6 U	6 U	5 U	5 U	5 U
1,2-Dichloropropane		6 U	6 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		6 U	6 U	5 U	5 U	5 U
Trichloroethene		6 U	118 %	117 %	5 U	114 %
Dibromochloromethane		6 U	6 U	5 U	5 U	5 U
1,1,2-Trichloroethane		6 U	6 U	5 U	5 U	5 U
Benzene		6 U	104 %	102 %	5 U	100 %
Trans-1,3-Dichloropropene		6 U	6 U	5 U	5 U	5 U
Bromoform		6 U	6 U	5 U	5 U	5 U
4-Methyl-2-pentanone		12 U	11 U	10 U	10 U	10 U
2-Hexanone		12 U	11 U	10 U	10 U	10 U
Tetrachloroethene		6 U	6 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		6 U	6 U	5 U	5 U	5 U
Toluene		6 U	107 %	106 %	5 U	101 %

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0211L177 Client: TNUHANFORD F03-005 H1977 Work Order: 11343606001 Page: 1b

	Cust ID:	B15YL7	B15YL7	B15YL7	VBLKZS	VBLKZS BS
	RFW#:	001	001 MS	001 MSD	02LVX657-MB1	02LVX657-MB1
Chlorobenzene		6 U	105 %	104 %	5 U	101 %
Ethylbenzene		6 U	6 U	5 U	5 U	5 U
Styrene		6 U	6 U	5 U	5 U	5 U
Xylene (total)		6 U	6 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Lionville Laboratory Use Only

02111L177

Custody Transfer Record/Lab Work Request

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI — LIONVILLE LABORATORY INC

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

Project #: 11843-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: Orlette Johnson

QC: SPCC Del: STD TAT: 30 45 Days

Date Rec'd: 11-19-02 Date Due: 12-19-02

	A	B	C		D		E		F	G
Refrigerator #	1	4	4		4		4		4	4
#/Type Container – Liquid										
#/Type Container – Solid	1ag	1ag	1ag		1ag		1bg		1ag	1ag
Volume – Liquid										
Volume – Solid	60	250	250		60		170		500	60
Preservatives	—	—	—		—		—		—	—
ANALYSES REQUESTED	ORGANIC: TCL VOA	BNA (1)	Pest/PCB	Herb	Alcohols Glycols Ketones		INORG: TCL Metal (2)	CN	(3) Anions	pH
Lionville Laboratory Use Only	0624H	0625X ODRO	OPCB		OGESC		MET (1) ICPG		INORG (1)	IPH

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	A	B	C	Herb	D		E	CN	F	G
001	B15YL7	X	X	S	11-14-02	0939	X	X	X		X		X		X	X

Special Instructions:

DATE/REVISIONS:
MET (1) 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca, Cu,
2. Fe, Mg, Mn, Mo, Ni, K, Na, Tl, V, Zn, Hg
INORG (1) 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4
4. IN3N2, INH3N, ISFD, ICNYO
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # Fed Ex / See Below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 14.3 °C

Relinquished by	Received by	Date	Time
Fed Ex	D. [illegible]	11-19-02	0910

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

7912 3430 5074/2.1° 7912 3430 5030
7912 3430 5052/ 2.4°C

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-005-011	Page 1 of 1
Collector R. Nielson	Company Contact: Steve Trent	Telephone No.: 373-5869	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-1		SAF No.: F03-005	Air Quality ☐
Ice Chest No.: SEE 057C	Field Logbook No.: HNF-N-3251	COA: 117514ES10	Method of Shipment: Federal Express	
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No.: A030 030		Bill of Lading/Air Bill No.: SEE 057C	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	SAMPLE ANALYSIS
				Cool 4C	aG	1	60g 60ml	VOA - 8260A (TCL)
				Cool 4C	aG	1	250g 250ml	See item (1) in Special Instructions.
				Cool 4C	aG	1	60g 60ml	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}
				Cool 4C	aG	1	250g 250ml	PCBs - 8082
				None	~~GP~~ aG	1	125g 120ml	See item (2) in Special Instructions.
				None	~~GP~~ aG	1	500g 500ml	See item (3) in Special Instructions.
				None	~~GP~~ aG	1	60g 60ml	pH (Soil) - 9045
				None	~~GP~~ aG	1	1000g 1000ml	See item (4) in Special Instructions.
				None	~~GP~~ aG	1	500g 500ml	Nickel-63; Technetium-99; Tritium - 3H
B15YL7	SOIL	11-14-02	0939	X	X	X	X	X X X X X X X X

RJN 11/13/02

RJN 11/13/02

RJN 11/13/02

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson	11-14-02 1320	REF # 1B/3728	11-14-02 1320
S. Gale	11/18/02 1100		
REF 1B	11/18/02 1100	S. Gale	11/18/02 1100
S. Gale	11/18/02 1100	FED EX	
FED EX	11-19-02 0910		11-19-02 0910

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 – Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Personnel not available to relinquish samples from the 3728 Ref # 1B on 11/18/02	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By		Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TMU Hanford

Purchase Order/Project:

DATE: 11.19.02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L177

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	~~☒ Yes~~ 11.19.02	☒ No	☐ N/A	☒ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 99-058 / 14.3°C

#1 Cooler ERC 99.058 = 14.3°

ERC FS-002 / 2.4°C

ERC 99.055 / 2.1°C

Laboratory Sample Custodian: [signature]

Laboratory Project Manager:

10

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

DATE RECEIVED: 11/19/02 LVL LOT # :0211L177

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL7	001	S	02LE1384	11/14/02	11/21/02	12/05/02
B15YL7	001 MS	S	02LE1384	11/14/02	11/21/02	12/05/02
B15YL7	001 MSD	S	02LE1384	11/14/02	11/21/02	12/05/02
LAB QC:						
SBLKIL	MB1	S	02LE1384	N/A	11/21/02	11/23/02
SBLKIL	MB1 BS	S	02LE1384	N/A	11/21/02	11/23/02

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD F03-005
LVL #: 0211L177
SDG/SAF #: H1977/F03-005

W.O. #: 11343-606-001-9999-00
Date Received: 11-19-2002

SEMIVOLATILE

One (1) soil sample was collected on 11-14-2002.

The sample and its associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 11-21-2002 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for client specified Semivolatile target compounds on 11-23-2002 and 12-05-2002.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy with the exception of a discrepancy, which has been recorded on the Sample Receipt Checklist (p-12).

2. The sample was extracted and analyzed within required holding time.

3. Non-target compounds were detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. One (1) of twenty-two (22) matrix spike recoveries was outside EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.

8. Internal standard area criteria were not met for the sample. However; the GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly and all surrogate recoveries were within QC limits; consequently, the sample was not reanalyzed.

9. Manual integrations are performed according to OP 21-06A-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

by _____ 12.19.02

J. Michael Taylor
President
Lionville Laboratory Incorporated

Date

som\gorup\data\bna\tnu-hanford-0211-177.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions *and carried through all the steps in the method. Spike recoveries are reported.*
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

RFW Batch Number: 0211L177 Client: TNUHANFORD F03-005 H1977 Work Order: 11343606001 Report Date: 12/06/02 16:10 Page: 1a

	Cust ID:	B15YL7	B15YL7	B15YL7	SBLKIL	SBLKIL BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LE1384-MB1	02LE1384-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	69 %	70 %	56 %	80 %	72 %
	2-Fluorobiphenyl	69 %	76 %	61 %	80 %	78 %
	p-Terphenyl-d14	88 %	92 %	84 %	100 %	102 %
	Phenol-d5	72 %	68 %	57 %	84 %	72 %
	2-Fluorophenol	74 %	73 %	58 %	83 %	76 %
	2,4,6-Tribromophenol	76 %	81 %	67 %	74 %	78 %
Phenol		350 U	67 %	58 %	330 U	74 %
bis(2-Chloroethyl)ether		350 U	350 U	350 U	330 U	330 U
2-Chlorophenol		350 U	71 %	59 %	330 U	76 %
1,3-Dichlorobenzene		350 U	350 U	350 U	330 U	330 U
1,4-Dichlorobenzene		350 U	73 %	57 %	330 U	78 %
1,2-Dichlorobenzene		350 U	350 U	350 U	330 U	330 U
2-Methylphenol		350 U	350 U	350 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)		350 U	350 U	350 U	330 U	330 U
3- and/or 4-Methylphenol		350 U	350 U	350 U	330 U	330 U
N-Nitroso-Di-n-propylamine		350 U	78 %	66 %	330 U	78 %
Hexachloroethane		350 U	350 U	350 U	330 U	330 U
Nitrobenzene		350 U	350 U	350 U	330 U	330 U
Isophorone		350 U	350 U	350 U	330 U	330 U
2-Nitrophenol		350 U	350 U	350 U	330 U	330 U
2,4-Dimethylphenol		350 U	350 U	350 U	330 U	330 U
bis(2-Chloroethoxy)methane		350 U	350 U	350 U	330 U	330 U
2,4-Dichlorophenol		350 U	350 U	350 U	330 U	330 U
1,2,4-Trichlorobenzene		350 U	72 %	61 %	330 U	78 %
Naphthalene		350 U	350 U	350 U	330 U	330 U
4-Chloroaniline		350 U	350 U	350 U	330 U	330 U
Hexachlorobutadiene		350 U	350 U	350 U	330 U	330 U
4-Chloro-3-methylphenol		350 U	76 %	67 %	330 U	72 %
2-Methylnaphthalene		350 U	350 U	350 U	330 U	330 U
Hexachlorocyclopentadiene		350 U	350 U	350 U	330 U	330 U
2,4,6-Trichlorophenol		350 U	350 U	350 U	330 U	330 U
2,4,5-Trichlorophenol		870 U	870 U	870 U	830 U	830 U

*= Outside of EPA CLP QC limits.

Cust ID:	B15YL7	B15YL7	B15YL7	SBLKIL	SBLKIL BS
RFW#:	001	001 MS	001 MSD	02LE1384-MB1	02LE1384-MB1
2-Chloronaphthalene	350 U	350 U	350 U	330 U	330 U
2-Nitroaniline	870 U	870 U	870 U	830 U	830 U
Dimethylphthalate	350 U	350 U	350 U	330 U	330 U
Acenaphthylene	350 U	350 U	350 U	330 U	330 U
2,6-Dinitrotoluene	350 U	350 U	350 U	330 U	330 U
3-Nitroaniline	870 U	870 U	870 U	830 U	830 U
Acenaphthene	350 U	82 %	64 %	330 U	81 %
2,4-Dinitrophenol	870 U	870 U	870 U	830 U	830 U
4-Nitrophenol	870 U	72 %	58 %	830 U	76 %
Dibenzofuran	350 U	350 U	350 U	330 U	330 U
2,4-Dinitrotoluene	350 U	96 * %	71 %	330 U	78 %
Diethylphthalate	350 U	350 U	350 U	330 U	330 U
4-Chlorophenyl-phenylether	350 U	350 U	350 U	330 U	330 U
Fluorene	350 U	350 U	350 U	330 U	330 U
4-Nitroaniline	870 U	870 U	870 U	830 U	830 U
4,6-Dinitro-2-methylphenol	870 U	870 U	870 U	830 U	830 U
N-Nitrosodiphenylamine (1)	350 U	350 U	350 U	330 U	330 U
4-Bromophenyl-phenylether	350 U	350 U	350 U	330 U	330 U
Hexachlorobenzene	350 U	350 U	350 U	330 U	330 U
Pentachlorophenol	870 U	62 %	54 %	830 U	78 %
Phenanthrene	350 U	350 U	350 U	330 U	330 U
Anthracene	350 U	350 U	350 U	330 U	330 U
Carbazole	350 U	350 U	350 U	330 U	330 U
Di-n-Butylphthalate	350 U	350 U	350 U	330 U	330 U
Fluoranthene	350 U	350 U	350 U	330 U	330 U
Pyrene	350 U	95 %	78 %	330 U	103 %
Butylbenzylphthalate	350 U	350 U	350 U	330 U	330 U
3,3'-Dichlorobenzidine	350 U	350 U	350 U	330 U	330 U
Benzo(a)anthracene	350 U	350 U	350 U	330 U	330 U
Chrysene	350 U	350 U	350 U	330 U	330 U
bis(2-Ethylhexyl)phthalate	30 JB	350 U	350 U	20 J	330 U
Di-n-Octyl phthalate	350 U	350 U	350 U	330 U	330 U
Benzo(b)fluoranthene	350 U	350 U	350 U	330 U	330 U
Benzo(k)fluoranthene	350 U	350 U	350 U	330 U	330 U
Benzo(a)pyrene	350 U	350 U	350 U	330 U	330 U
Indeno(1,2,3-cd)pyrene	350 U	350 U	350 U	330 U	330 U
Dibenzo(a,h)anthracene	350 U	350 U	350 U	330 U	330 U
Benzo(g,h,i)perylene	350 U	350 U	350 U	330 U	330 U
Tributylphosphate	350 U	350 U	350 U	330 U	330 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B15YL7

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD F03-005 H1977

Matrix: (soil/water) SOIL

Lab Sample ID: 0211L177-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: A120513

Level: (low/med) LOW

Date Received: 11/19/02

% Moisture: 4 decanted: (Y/N)

Date Extracted: 11/21/02

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 12/05/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		ALDOL CONDENSATE	3.640	4000	JAB
2.		ALDOL CONDENSATE	3.992	40000	JAB
3.		ALDOL CONDENSATE	4.635	200	JAB
4.		ALDOL CONDENSATE	5.291	4000	JAB
5.		ALDOL CONDENSATE	6.476	700	JAB

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKIL

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD F03-005 H1977

Matrix: (soil/water) SOIL

Lab Sample ID: 02LE1384-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D112308

Level: (low/med) LOW

Date Received: 11/21/02

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 11/21/02

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 11/23/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		ALDOL CONDENSATE	6.336	4000	JA
2.		ALDOL CONDENSATE	6.953	40000	JA
3.		ALDOL CONDENSATE	7.579	300	JA
4.		ALDOL CONDENSATE	8.301	4000	JA
5.		ALDOL CONDENSATE	9.614	700	JA

Lionville Laboratory Use Only

02111L177

Custody Transfer Record/Lab Work Request

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI — Lionville Laboratory Inc.

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

Project #: 11843-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: Orlette Johnson

QC: SPEC Del: STD TAT: 30 45 days

Date Rec'd: 11-19-02 Date Due: 12-19-02

	A	B	C		D			E		F	G				
Refrigerator #	1	4	4		4			4		4	4				①
#/Type Container – Liquid															
#/Type Container – Solid	bag	bag	bag		bag			bag		bag	bag				
Volume – Liquid															
Volume – Solid	60	250	250		60			120		500	60				
Preservatives	—	—	—		—			—		—	—				
ANALYSES REQUESTED	ORGANIC: TCL VOA	BNA (1)	Pest/PCB	Herb	Alcohols Glycols Ketones			INORG: KP Metal (2)	CN	IC (3) Anions	pH				
Lionville Laboratory Use Only	0624H	0625X ODRO	OPCB		OGCSC			MET① ICP6		INORG①	pH				

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	TCL VOA	BNA	Pest/PCB	Herb	Alcohols Glycols Ketones			KP Metal	CN	IC Anions	pH
001	B15YL7	X	X	S	11-14-02	0939	X	X	X		X			X		X	X

Special Instructions:

DATE/REVISIONS:

MET① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca, Cu,

2. Fe, Mg, Mn, Mo, Ni, K, Na, Tl, V, Zn, Hg

INORG① 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4

4. IN3N2, INH3N, ISFD, ICNTO

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # See Below

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 14.3 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	D. [illegible]	11-19-02	0910	COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 7912 3430 5074/2.1° 7912 3430 5030 7912 3430 5052/2.4°C

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-005-011	Page 1 of 1
Collector R. Nielson	Company Contact: Steve Trent	Telephone No.: 373-5869	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-1		SAF No.: F03-005	Air Quality ☐
Ice Chest No.: SEE 057C	Field Logbook No.: HNF-N-3251	COA: 117514ES10	Method of Shipment: Federal Express	
Shipped To: ~~ERDLINE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No.: A030 030		Bill of Lading/Air Bill No.: SEE 057C	

POSSIBLE SAMPLE HAZARDS/REMARKS											
Special Handling and/or Storage	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	
	Type of Container	aG	aG	aG	aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	RJN 11/13/02
	No. of Container(s)	1	1	1	1	1	1	1	1	1	
	Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml	
SAMPLE ANALYSIS		VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions. RJN 11/13/02	Nickel-63; Technetium-99; Tritium - H3 RJN 11/13/02	

Sample No.	Matrix *	Sample Date	Sample Time										
B15YL7	SOIL	11-14-02	0939	X	X	X	X	X	X	X	X		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: R. Nielson	Date/Time: 11-14-02 1320	Received By/Stored In: REF # 1B/3728	Date/Time: 11-14-02 1320
Relinquished By/Removed From: SJGALE	Date/Time: 11/18/02 1100	Received By/Stored In: S	Date/Time:
Relinquished By/Removed From: REF 1B	Date/Time: 11/18/02 1100	Received By/Stored In: SJGALE	Date/Time: 11/18/02 1100
Relinquished By/Removed From: SJGALE	Date/Time: 11/18/02 1100	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time: 11-19-02 0910	Received By/Stored In:	Date/Time: 11-19-02 0910
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

Personnel not available to relinquish samples from the 3728 Ref # 1B on 11/18/02

Matrix *: S=Soil; SE=Sediment; SO=Solid; SI=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TRU Hanford

Purchase Order/Project:

DATE: 11.19.02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L77

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	MD 11.19.02 ☒ Yes	☒ No	☐ N/A	☒ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 99-058 / 14.3°C #1 Cooler ERC 99-058 = 14.3°

ERC FS-002 / 2.4°C

ERC 99-055 / 2.1°C

Laboratory Sample Custodian: D. Smith

Laboratory Project Manager:

12

Lionville Laboratory, Inc.
PCB ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

DATE RECEIVED: 11/19/02 LVL LOT # :0211L177

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL7	001	S	02LE1379	11/14/02	11/20/02	11/29/02
B15YL7	001 MS	S	02LE1379	11/14/02	11/20/02	11/29/02
B15YL7	001 MSD	S	02LE1379	11/14/02	11/20/02	11/29/02
LAB QC:						
PBLKGE	MB1	S	02LE1379	N/A	11/20/02	11/28/02
PBLKGE	MB1 BS	S	02LE1379	N/A	11/20/02	11/28/02

12/5/a

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-005
LVL #: 0211L177
SDG/SAF #: H1977/F03-005

W.O. #: 11343-606-001-9999-00
Date Received: 11-19-02

PCB

One (1) soil sample was collected on 11-14-02.

The sample and its associated QC samples were extracted on 11-20-02 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 11-28,29-02. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. Please refer to the Sample Receipt Checklist for sample discrepancies in LvLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. The sample and its associated QC samples received a Sulfuric Acid cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/6/02
Date

pef\r:\group\data\pest\tnu hanford\11L-177.pcb

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 12/02/02 17:31

RFW Batch Number: **0211L177** Client: **TNUHANFORD F03-005 H1977** Work Order: 11343606001 Page: 1

	Cust ID:	B15YL7	B15YL7	B15YL7	PBLKGE	PBLKGE BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LE1379-MB1	02LE1379-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		95 %	95 %	95 %	90 %	90 %
Decachlorobiphenyl		110 %	115 %	110 %	110 %	110 %
Aroclor-1016		35 U	92 %	91 %	33 U	93 %
Aroclor-1221		70 U	70 U	70 U	67 U	67 U
Aroclor-1232		35 U	35 U	35 U	33 U	33 U
Aroclor-1242		35 U	35 U	35 U	33 U	33 U
Aroclor-1248		35 U	35 U	35 U	33 U	33 U
Aroclor-1254		35 U	35 U	35 U	33 U	33 U
Aroclor-1260		35 U	94 %	95 %	33 U	93 %

12/3/02

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only

02111L177

Custody Transfer Record/Lab Work Request

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

Project #: 11843-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: Orlette Johnson

QC: SPEC Del: STD TAT: 30 45 days

Date Rec'd: 11-19-02 Date Due: 12-19-02

	A	B	C		D		E		F	G
Refrigerator #	1	4	4		4		4		4	4
#/Type Container – Liquid										
#/Type Container – Solid	1ag	1ag	1ag		1ag		1ag		1ag	1ag
Volume – Liquid										
Volume – Solid	60	250	250		60		120		500	60
Preservatives	—	—	—		—		—		—	—
ANALYSES REQUESTED	ORGANIC: TCL VOA	BNA (1)	Pest PCB	Herb	Alcohols Glycols Ketones	INORG: TCL Metal (2)	CN		ICL (3) Anions	PH
Lionville Laboratory Use Only	0624H	0625X ODRO	OPCB		OGESC	MET① ICRL			INORG①	IPH

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	PCB	D	Metals	Inorg	pH
001	B15YL7	X	X	S	11-14-02	0939	X	X	X	X	X	X	X

Special Instructions:

DATE/REVISIONS:

MET① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca, Cu,
2. Fe, Mg, Mn, Mo, Ni, K, Na, Tl, V, Zn, Hg
INORG① 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4
4. IN3N2, INH3N, ISFD, ICN10
5.
6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
Airbill # 2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 14.3 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	[signature]	11-19-02	0910				

COMPOSITE WASTE

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

7912 3430 5074/2.1° 7912 3430 5030

7912 3430 5052/ 2.4°C

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-011	Page 1 of 1

Collector: R. Nielson	Company Contact: Steve Trent	Telephone No.: 373-5869	Project Coordinator: TRENT, SJ
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-1		SAF No.: F03-005
Ice Chest No.: SEE 037C	Field Logbook No.: HNF-N-3251	COA: 117514ES10	Method of Shipment: Federal Express
Shipped To: ~~EDER-INE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No.: A030 030		Bill of Lading/Air Bill No.: SEE 057C

Price Code: 8N — Data Turnaround: 45 Days — Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG RN 11/13/02
No. of Container(s)	1	1	1	1	1	1	1	1	1
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions. 11-18-02	Nickel-63; Technetium-99; Tritium - H3 RJN 11/13/02

Sample No.	Matrix *	Sample Date	Sample Time									
B15YL7	SOIL	11-14-02	0939	X	X	X	X	X	X	X	K	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson	11-14-02 1320	REF # 1B 3728	11-14-02 1320
S. Gale	11/18/02 1100		
REF 1B	11/18/02 1100	S. Gale	11/18/02 1100
S. Gale	11/18/02 1100	FED EX	
FED EX	11-19-02 0910		11-19-02 0910

Sign/Print Names

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 – Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

Personnel not available to relinquish samples from the 3728 Ref # 1B on 11/18/02

LABORATORY SECTION	Received By	Title		Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TMU Hanford

Purchase Order/Project:

DATE: 11.19.02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L177

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☒ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☒ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	11.19.02 ~~☒ Yes~~	☒ No	☐ N/A	☒ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☒ N/A	☐ see Comment #
12. coc signed and dated?	☒ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 99-058 / 14.3°C #1 Cooler ERC 99-058 = 14.3

ERC FS-002 / 2.4°C

ERC 99-055 / 2.1°C

Laboratory Sample Custodian: D. Smith

Laboratory Project Manager:

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

DATE RECEIVED: 11/19/02 LVL LOT # :0211L177

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL7	001	S	02LE1380	11/14/02	11/20/02	11/26/02
B15YL7	001 MS	S	02LE1380	11/14/02	11/20/02	11/26/02
B15YL7	001 MSD	S	02LE1380	11/14/02	11/20/02	11/26/02
LAB QC:						
BLK	MB1	S	02LE1380	N/A	11/20/02	11/27/02
BLK	MB1 BS	S	02LE1380	N/A	11/20/02	11/27/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-005
LVL #: 0211L177
SDG/SAF #: H1977/F03-005

W.O. #: 11343-606-001-9999-00
Date Received: 11-19-02

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 11-14-02.

The sample and its associated QC samples were extracted on 11-20-02 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 11-26,27-02. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8015B. The analysis met the intent of method WTPH-D.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. Please refer to the Sample Receipt Checklist for sample discrepancies in LvLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. The method blank was below the reporting limits for all target compounds.
4. All surrogate recoveries were within acceptance criteria.
5. The blank spike recovery was within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/16/02
Date

pef\r:\group\data\dro\tnu hanford\11L-177.doc

GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC

Report Date: 12/03/02 12:39

RFW Batch Number: **0211L177** Client: **TNUHANFORD F03-005 H1977** Work Order: 11343606001 Page: 1

	Cust ID:	B15YL7	B15YL7	B15YL7	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	02LE1380-MB1	02LE1380-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
p-Terphenyl		98 %	109 %	117 %	102 %	96 %
Diesel Range Organics		12.5 U	85 %	95 %	12.0 U	71 %
Kerosene		12.5 U	12.5 U	12.5 U	12.0 U	12.0 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only
02111L177

Custody Transfer Record/Lab ...

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU Hanford F03-005

Est. Final Proj. Sampling Date

Project # 11843-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager Orlette Johnson

QC SPEC Del 5(?) TAT 30 45 Days

Date Rec'd 11-19-02 Date Due 12-19-02

		A	B	C		D		E		F	G
Refrigerator #		1	4	4		4		4		4	4
#/Type Container	Liquid										
	Solid	1ag	1ag	1ag		1ag		1ag		1ag	1ag
Volume	Liquid										
	Solid	60	250	250		60		120		500	60
Preservatives		–	–	–		–		–		–	–
ANALYSES REQUESTED →		ORGANIC: TCL VOA	BNA (1)	Pest/ PCB	Herb	Alcohols Glycol Kerosene		INORG: TCL Metal (2)	CN	IC (3) Anions	pH
Lionville Laboratory Use Only		0624N	0625X ODRO	OPCB		OGCSC		MET ① ICR6		INORG ①	I PH

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	A	B	C		D		E		F	G
001	B15YL7	X	X	S	11-14-02	0939	X	X	X		X		X		X	X

Special Instructions:

DATE/REVISIONS:
MET ① 1. Al, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca, Cu,
2. Fe, Mg, Mn, Mo, Ni, K, Na, Tl, V, Zn, Hg
INORG ① 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4
4. IN3N2, INH3N, ISFD, ICNTO
5.
6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
Airbill # see below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 14.3 °C

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	11-19-02	0910

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

7912 3430 5074/2.1° 7912 3430 5030
7912 3430 5052/2.4°c

FH-Central Plateau Project — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F03-005-011 | Page 1 of 1

Collector: R. Nielson	Company Contact: Steve Trent; Telephone No.: 373-5869	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-1	SAF No.: F03-005	Air Quality: ☐
Ice Chest No.: SEE 057C	Field Logbook No.: HNF-N-3251; COA: 117514ES10	Method of Shipment: Federal Express	
Shipped To: ~~EDERLINE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No.: A030 030	Bill of Lading/Air Bill No.: SEE 057C	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG RN 11/13/02
No. of Container(s)	1	1	1	1	1	1	1	1	1
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) (1-Propanol, Ethanol)	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions. AD 11/18/02	Nickel-63; Technetium-99; Tritium - H3 RJN 11/13/02

Sample No.	Matrix *	Sample Date	Sample Time										
B15YL7	SOIL	11-14-02	0939	X	X	X	X	X	X	X	X		

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R Nielson R Nielson	11-14-02 1320	REF # 1B/3728	11-14-02 1320
S Gale	11/18/02 1100		
REF 1B	11/18/02 1100	S J Gale	11/18/02 1100
S J Gale	11/18/02 1100	FED EX	
FED EX	11-19-02 0910		11-19-02 0910

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

Personnel not available to relinquish samples from the 3728 Ref # 1B on 11/18/02

Matrix *: S=Soil; SE=Sediment; SO=Solid; SI=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title		Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

LIENT: TMU Hanford

rchase Order/Project:

DATE: 11.19.02

AF# /SOW# / Release #: F03-005

aboratory SDG #: 0211L177

OTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	~~☑ Yes~~ 11.19.02	☒ No	☐ N/A	☒ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 99-058 / 14.3°C

#1 Cooler ERC 99.058 = 14.3°

ERC FS-002 / 2.4°C

ERC 99-055 / 2.1°C

Laboratory Sample Custodian: D Y Smith

Laboratory Project Manager:

Lionville Laboratory, Inc.
GCSC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

DATE RECEIVED: 11/19/02 LVL LOT # :0211L177

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL7	001	S	02LE1426	11/14/02	11/25/02	11/25/02
B15YL7	001 MS	S	02LE1426	11/14/02	11/25/02	11/25/02
B15YL7	001 MSD	S	02LE1426	11/14/02	11/25/02	11/25/02
LAB QC:						
BLK	MB1	S	02LE1426	N/A	11/25/02	11/25/02
BLK	MB1 BS	S	02LE1426	N/A	11/25/02	11/25/02
BLK	MB1 BSD	S	02LE1426	N/A	11/25/02	11/25/02

12/4/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD F03-005
LVL#: 0211L177
SDG/SAF#: H1977/F03-005

W.O.#: 11343-606-001-9999-00
Date Received: 11-19-02

GC SCAN

One (1) soil sample was collected on 11-14-02.

The sample and its associated QC samples were analyzed on 11-25-02 according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures based on method 8015B for n-propyl Alcohol and Ethanol.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. All required holding times for analysis have been met.

3. The method blank was below the reporting limits for all target compounds.

4. Surrogates are not currently employed in the methodology.

5. All blank spike recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. All initial calibrations were within acceptance criteria.

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/6/02
Date

r:\group\data\gcsc\11L-177.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.

GLOSSARY OF GC SCAN DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum *detection limit for the sample (not the method detection limit)* is reported with the U (e.g., 10U).

J = *Indicates an estimated value. This flag is used in cases where a target analyte is* detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the *sample. It indicates possible/probable blank contamination.*

E = Indicates that the compound was detected beyond the calibration range and was *subsequently analyzed at a dilution.*

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = *Dilution Factor.*

NR = Not Required.

SP = Indicates Spiked Compound.

Lionville Laboratory, Inc.

GC SCAN

Report Date: 12/03/02 15:06

RFW Batch Number: **0211L177** Client: **TNUHANFORD F03-005 H1977** Work Order: 11343606001 Page: 1

	Cust ID:	B15YL7	B15YL7	B15YL7	BLK	BLK BS	BLK BSD
Sample	RFW#:	001	001 MS	001 MSD	02LE1426-MB1	02LE1426-MB1	02LE1426-MB1
Information	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

	fl		fl		fl		fl		fl		fl
n-Propyl Alcohol	22	U	101	%	100	%	25	U	101	%	98	%
Ethanol	22	U	101	%	102	%	25	U	103	%	102	%

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only

02111L177

Custody Transfer Record/Lab Work Request

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU Hanford F03-005

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999.00

Project Contact/Phone #

Lionville Laboratory Project Manager Orlette Johnson

QC SPCC Del STD TAT 30 45 Days

Date Rec'd 11-19-02 Date Due 12-19-02

		A	B	C		D			E		F	G				
Refrigerator #		1	4	4		4			4		4	4				
#/Type Container	Liquid															
	Solid	1ag	1ag	1ag		1ag			1g		1ag	1ag				
Volume	Liquid															
	Solid	60	250	250		60			120		500	60				
Preservatives		—	—	—		—			—		—	—				
ANALYSES REQUESTED →		ORGANIC: TCL VOA	BNA (1)	Pest/PCB	Herb	Alcohols/Glycols/Ketones			INORG: KP Metal (2)	CN	IC Anions (3)	pH				
Lionville Laboratory Use Only		0624H	0625X ODRO	OPCB		OGESC			MET ① ICR6		INORG ①	IPH				

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	A	B	C		D			E		F	G				
001	B15YL7	X	X	S	11-14-02	0939	X	X	X		X			X		X	X				

Special Instructions:

DATE/REVISIONS:

MET ① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca, Cu,
2. Fe, Mg, Mn, Mo, Ni, K, Na, Tl, V, Zn, Hg
INORG ① 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4
4. IN3N2, INH3N, ISFD, ICN10
5.
6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
Airbill # See below
2) Ambient or Chilled (circled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 14.3 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	D. [illegible]	11-19-02	0910	COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:
7912 3430 5074/2.1° 7912 3430 5030
7912 3430 5052/2.4°C

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-005-011	Page 1 of 1
Collector R. Nielson	Company Contact: Steve Trent	Telephone No.: 373-5869	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-1		SAF No.: F03-005	Air Quality ☐
Ice Chest No.: SEE 037C	Field Logbook No.: HNF-N-3251	COA: 117514ES10	Method of Shipment: Federal Express	
Shipped To: ~~ERDLINE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No.: A030 030		Bill of Lading/Air Bill No.: SEE 057C	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG RN 11/13/02
No. of Container(s)	1	1	1	1	1	1	1	1	1
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml

SAMPLE ANALYSIS

	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) (1-Propanol, Ethanol)	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions. 11/18/02	Nickel-63; Technetium-99; Tritium-3 RJN 11/13/02
Sample No. / Matrix * / Sample Date / Sample Time									
B15YL7 / SOIL / 11-14-02 / 0939	X	X	X	X	X	X	X	X	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson	11-14-02 1320	REF # 1B 3728	11-14-02 1320
S. Gale	11/18/02 1100		
REF 1B	11/18/02 1100	S. Gale	11/18/02 1100
S. Gale	11/18/02 1100	FED EX	
FED EX	11-19-02 0910		11-19-02 0910

Sign/Print Names

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

Personnel not available to relinquish samples from the 3728 Ref # 1B on 11/18/02

Matrix *: S=Soil; SD=Sediment; SO=Solid; SL=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TMU Hanford

Purchase Order/Project:

DATE: 11.19.02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L177

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	~~☒ Yes~~ 11.19.02	☒ No	☐ N/A	☒ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

#1 Cooler ERC 99-058 = 14.3

ERC 99-058 / 14.3°C

ERC FS-002 / 2.4°C

ERC 99-055 / 2.1°C

Laboratory Sample Custodian:

Laboratory Project Manager:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

DATE RECEIVED: 11/19/02 LVL LOT # :0211L177

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL7						
SILVER, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
SILVER, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
SILVER, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
ALUMINUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
ALUMINUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
ALUMINUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
ARSENIC, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
ARSENIC, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
ARSENIC, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
BORON, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
BORON, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
BORON, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
BARIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
BARIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
BARIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
BERYLLIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
BERYLLIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
BERYLLIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
BISMUTH, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
BISMUTH, TOTAL REP	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
BISMUTH, TOTAL SPIKE	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
CALCIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
CALCIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
CALCIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
CADMIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
CADMIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
CADMIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
CHROMIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
CHROMIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
CHROMIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
COPPER, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
COPPER, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
COPPER, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
IRON, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
IRON, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

DATE RECEIVED: 11/19/02 LVL LOT # :0211L177

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
IRON, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
MERCURY, TOTAL	001	S	02C0350	11/14/02	11/26/02	11/27/02
MERCURY, TOTAL	001 REP	S	02C0350	11/14/02	11/26/02	11/27/02
MERCURY, TOTAL	001 MS	S	02C0350	11/14/02	11/26/02	11/27/02
POTASSIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
POTASSIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
POTASSIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
MAGNESIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
MAGNESIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
MAGNESIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
MANGANESE, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
MANGANESE, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
MANGANESE, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
MOLYBDENUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
MOLYBDENUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
MOLYBDENUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
SODIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
SODIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
SODIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
NICKEL, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
NICKEL, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
NICKEL, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
LEAD, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
LEAD, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
LEAD, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
SELENIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
SELENIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
SELENIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
THALLIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
THALLIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
THALLIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
VANADIUM, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
VANADIUM, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
VANADIUM, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02
ZINC, TOTAL	001	S	02L0691	11/14/02	11/25/02	11/27/02
ZINC, TOTAL	001 REP	S	02L0691	11/14/02	11/25/02	11/27/02
ZINC, TOTAL	001 MS	S	02L0691	11/14/02	11/25/02	11/27/02

LAB QC:

SILVER LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

DATE RECEIVED: 11/19/02 LVL LOT # :0211L177

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILVER, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
ALUMINUM LABORTORY	LC1 BS	S	02L0691	N/A	11/25/02	11/27/02
ALUMINUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/27/02
ARSENIC LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
ARSENIC, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
BORON LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
BORON, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
BARIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
BARIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
BERYLLIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
BERYLLIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
BISMUTH, LCS	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
BISMUTH, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
CALCIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/27/02
CALCIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/27/02
CADMIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
CADMIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
CHROMIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
CHROMIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
COPPER LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
COPPER, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
IRON LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
IRON, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
MERCURY LABORATORY	LC1 BS	S	02C0350	N/A	11/26/02	11/27/02
MERCURY, TOTAL	MB1	S	02C0350	N/A	11/26/02	11/27/02
POTASSIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/27/02
POTASSIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/27/02
MAGNESIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/27/02
MAGNESIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/27/02
MANGANESE LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
MANGANESE, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
MOLYBDENUM LABORATOR	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
MOLYBDENUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
SODIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/27/02
SODIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/27/02
NICKEL LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
NICKEL, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
LEAD LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

DATE RECEIVED: 11/19/02 LVL LOT # :0211L177

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
SELENIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
SELENIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
THALLIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
THALLIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
VANADIUM LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
VANADIUM, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02
ZINC LABORATORY	LC1 BS	S	02L0691	N/A	11/25/02	11/26/02
ZINC, TOTAL	MB1	S	02L0691	N/A	11/25/02	11/26/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-005
LVL#: 0211L177
SDG/SAF#: H1977/F03-005

W.O.#: 11343-606-001-9999-00
Date Received: 11-19-02

METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 soil sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

   The sample was rerun for Aluminum, Calcium, Potassium, Magnesium, and Sodium.

3. All analyses were performed within the required holding times.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recoveries for 2 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B15YL7	Aluminum	40,000	98.3
	Iron	20,000	102.6

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12-10-02
Date

gmb/m11-177

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 021LL77

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A ✓3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	✓6010B		__200.7				__99
Antimony	__6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	✓6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	✓6010B		__200.7				__99
Bismuth	✓6010B [1]		__200.7 [1]			__1620	__99
Boron	✓6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	✓6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	✓6010B		__200.7				__99
Copper	✓6010B	__7211 [5]	__200.7	__220.2			__99
Iron	✓6010B		__200.7				__99
Lead	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	✓6010B		__200.7				__99
Manganese	✓6010B		__200.7				__99
Mercury	✓7470A [3]	✓7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	✓6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	✓6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	✓6010B [1]		__200.7 [1]			__1620	__99
Selenium	✓6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	✓6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	✓6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	✓6010B		__200.7				__99
Thallium	✓6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	✓6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1977 LVL LOT #: 0211L177

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B15YL7	Silver, Total	1.3	MG/KG	0.15	1.0
		Aluminum, Total	5290	MG/KG	2.3	1.0
		Arsenic, Total	3.4	MG/KG	0.40	1.0
		Boron, Total	0.54	MG/KG	0.22	1.0
		Barium, Total	69.1	MG/KG	0.03	1.0
		Beryllium, Total	0.18	MG/KG	0.02	1.0
		Bismuth, Total	0.62 u	MG/KG	0.62	1.0
		Calcium, Total	6950	MG/KG	2.0	1.0
		Cadmium, Total	0.11	MG/KG	0.04	1.0
		Chromium, Total	19.6	MG/KG	0.10	1.0
		Copper, Total	14.5	MG/KG	0.14	1.0
		Iron, Total	24100	MG/KG	2.1	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Potassium, Total	840	MG/KG	52.0	1.0
		Magnesium, Total	4500	MG/KG	4.1	1.0
		Manganese, Total	340	MG/KG	0.02	1.0
		Molybdenum, Total	0.18 u	MG/KG	0.18	1.0
		Sodium, Total	155	MG/KG	2.7	1.0
		Nickel, Total	8.3	MG/KG	0.14	1.0
		Lead, Total	4.3	MG/KG	0.25	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Thallium, Total	0.58 u	MG/KG	0.58	1.0
		Vanadium, Total	65.1	MG/KG	0.10	1.0
		Zinc, Total	44.9	MG/KG	0.08	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/10/02

CLIENT: TNUHANFORD F03-005 H1977 LVL LOT #: 0211L177

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	02L0691-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	2.2 u	MG/KG	2.2	1.0
		Arsenic, Total	0.38 u	MG/KG	0.38	1.0
		Boron, Total	0.21 u	MG/KG	0.21	1.0
		Barium, Total	0.04	MG/KG	0.03	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Bismuth, Total	0.59 u	MG/KG	0.59	1.0
		Calcium, Total	3.0	MG/KG	1.9	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.26	MG/KG	0.10	1.0
		Copper, Total	0.20	MG/KG	0.13	1.0
		Iron, Total	2.0 u	MG/KG	2.0	1.0
		Potassium, Total	49.8 u	MG/KG	49.8	1.0
		Magnesium, Total	3.9 u	MG/KG	3.9	1.0
		Manganese, Total	0.04	MG/KG	0.02	1.0
		Molybdenum, Total	0.18	MG/KG	0.17	1.0
		Sodium, Total	4.6	MG/KG	2.6	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.24 u	MG/KG	0.24	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
		Thallium, Total	0.56 u	MG/KG	0.56	1.0
		Vanadium, Total	0.10 u	MG/KG	0.10	1.0
		Zinc, Total	0.14	MG/KG	0.08	1.0
BLANK1	02C0350-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1977 LVL LOT #: 0211L177

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B15YL7	Silver, Total	5.8	1.3	4.7	95.7	1.0
		Aluminum, Total	5920	5290	190	331.8*	1.0
		Arsenic, Total	182	3.4	190	94.2	1.0
		Boron, Total	86.7	0.54	94.9	90.8	1.0
		Barium, Total	252	69.1	190	96.6	1.0
		Beryllium, Total	4.5	0.18	4.7	91.9	1.0
		Bismuth, Total	448	0.62u	474	94.5	1.0
		Calcium, Total	8780	6950	2370	76.9	1.0
		Cadmium, Total	4.6	0.11	4.7	95.6	1.0
		Chromium, Total	36.1	19.6	19.0	86.8	1.0
		Copper, Total	37.7	14.5	23.7	97.9	1.0
		Iron, Total	25100	24100	94.9	1069 *	1.0
		Mercury, Total	0.18	0.02	0.15	101.9	1.0
		Potassium, Total	3080	840	2370	94.6	1.0
		Magnesium, Total	6930	4500	2370	102.3	1.0
		Manganese, Total	394	340	47.5	115.4*	1.0
		Molybdenum, Total	89.5	0.18u	94.9	94.3	1.0
		Sodium, Total	2470	155	2370	97.7	1.0
		Nickel, Total	53.9	8.3	47.5	96.0	1.0
		Lead, Total	48.9	4.3	47.5	93.9	1.0
		Selenium, Total	175	0.40u	190	92.0	1.0
		Thallium, Total	183	0.58u	190	96.4	1.0
		Vanadium, Total	115	65.1	47.5	105.5	1.0
		Zinc, Total	93.7	44.9	47.5	102.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1977 LVL LOT #: 0211L177

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B15YL7	Silver, Total	1.3	1.5	14.3	1.0
		Aluminum, Total	5290	5430	2.5	1.0
		Arsenic, Total	3.4	3.6	5.7	1.0
		Boron, Total	0.54	0.54	0.74	1.0
		Barium, Total	69.1	70.2	1.6	1.0
		Beryllium, Total	0.18	0.15	14.9	1.0
		Bismuth, Total	0.62u	0.55u	NC	1.0
		Calcium, Total	6950	6480	7.0	1.0
		Cadmium, Total	0.11	0.11	3.9	1.0
		Chromium, Total	19.6	18.6	5.2	1.0
		Copper, Total	14.5	14.5	0.00	1.0
		Iron, Total	24100	24500	1.8	1.0
		Mercury, Total	0.02	0.02	9.5	1.0
		Potassium, Total	840	842	0.25	1.0
		Magnesium, Total	4500	4620	2.7	1.0
		Manganese, Total	340	373	9.3	1.0
		Molybdenum, Total	0.18u	0.24	NC 200	1.0
		Sodium, Total	155	154	0.84	1.0
		Nickel, Total	8.3	8.9	7.0	1.0
		Lead, Total	4.3	4.4	2.3	1.0
		Selenium, Total	0.40u	0.35u	NC	1.0
		Thallium, Total	0.58u	0.52u	NC	1.0
		Vanadium, Total	65.1	65.6	0.77	1.0
		Zinc, Total	44.9	46.0	2.4	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1977 LVL LOT #: 0211L177

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	02L0691-LC1	Silver, LCS	49.8	50.0	MG/KG	99.6
		Aluminum, LCS	488	500	MG/KG	97.5
		Arsenic, LCS	949	1000	MG/KG	94.9
		Boron, LCS	472	500	MG/KG	94.4
		Barium, LCS	494	500	MG/KG	98.8
		Beryllium, LCS	24.5	25.0	MG/KG	98.0
		Bismuth, LCS	485	500	MG/KG	97.0
		Calcium, LCS	2420	2500	MG/KG	96.8
		Cadmium, LCS	24.7	25.0	MG/KG	98.8
		Chromium, LCS	51.6	50.0	MG/KG	103.2
		Copper, LCS	126	125	MG/KG	101.0
		Iron, LCS	506	500	MG/KG	101.2
		Potassium, LCS	2380	2500	MG/KG	95.4
		Magnesium, LCS	2390	2500	MG/KG	95.4
		Manganese, LCS	78.0	75.0	MG/KG	104.0
		Molybdenum, LCS	512	500	MG/KG	102.4
		Sodium, LCS	2440	2500	MG/KG	97.5
		Nickel, LCS	200	200	MG/KG	99.9
		Lead, LCS	247	250	MG/KG	98.9
		Selenium, LCS	910	1000	MG/KG	91.0
		Thallium, LCS	999	1000	MG/KG	99.9
		Vanadium, LCS	258	250	MG/KG	103.3
		Zinc, LCS	98.6	100	MG/KG	98.6
LCS1	02C0350-LC1	Mercury, LCS	2.3	2.5	MG/KG	92.4

Lionville Laboratory Use Only

02111L177

Custody Transfer Record

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU Hanford F03-005

Est. Final Proj. Sampling Date

Project # 11243-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager Orlette Johnson

QC SPCC Del STD TAT 30 45 days

Date Rec'd 11-19-02 Date Due 12-19-02

	A	B	C		D			E		F	G
Refrigerator #	1	4	4		4			4		4	4
#/Type Container Liquid											
#/Type Container Solid	1ag	1ag	1ag		1ag			1ag		1ag	1ag
Volume Liquid											
Volume Solid	60	250	250		60			120		500	60
Preservatives	—	—	—		—			—		—	—
ANALYSES REQUESTED	ORGANIC: TCL VOA	BNA (1)	Pest/PCB	Herb	Alcohols Glycols			INORG: TAL Metal (2)	CN	IC (3) Anions	PH
Lionville Laboratory Use Only	0624H	0625X ODRO	OPCB		OGESC			MET① ICP		INORG①	ZPH

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	TCL VOA	BNA	Pest/PCB	Herb	Alcohols Glycols			TAL Metal	CN	IC Anions	PH
001	B15YL7	X	X	S	11-14-02	0938	X	X	X		X			X		X	X

Special Instructions:

DATE/REVISIONS:

MET ① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca, Co,
2. Fe, Mg, Mn, Mo, Ni, K, Na, Tl, V, Zn, Hg
INORG ① 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4
4. IN3N2, INH3N, ISFD, ICNTO
5.
6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___
Airbill # see below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 14.3 °C

Relinquished by	Received by	Date	Time
Fed Ex	D. [illegible]	11-19-02	0910

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

7912 3430 5074/2.1° 7912 3430 5030

7912 3430 5052/ 2.4°C

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-005-011	Page 1 of 1
Collector: R. Nielson	Company Contact: Steve Trent	Telephone No.: 373-5869	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location: SP-1		SAF No.: F03-005	Air Quality: ☐
Ice Chest No.: SEE 053PC	Field Logbook No.: HNF-N-3251	COA: 117514ES10	Method of Shipment: Federal Express	
Shipped To: ~~ERLINE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No.: A030 030		Bill of Lading/Air Bill No.: SEE 053PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG RJN 11/13/02
No. of Container(s)	1	1	1	1	1	1	1	1	1
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions. 1100 11/18/02	Nickel-63; Technetium-99; Tritium - H3 RJN 11/13/02

Sample No.	Matrix *	Sample Date	Sample Time									
B15YL7	SOIL	11-14-02	0939	X	X	X	X	X	X	X	K	

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Nielson R. Nielson 11-14-02	1320	REF # 1B/3728	11-14-02 1320
SJGALE 11/18/02	11/18/02 1100	S	
REF 1B 111802	1100	SJGALE 11/18/02	1100
SJGALE 11/18/02	1100	FED EX	
FED EX	11-19-02 0910	[illegible]	11-19-02 0910

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

Personnel not available to relinquish samples from the 3728 Ref # 1B on 11/18/02

Matrix *: S=Soil; SE=Sediment; SO=Solid; SL=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

LIENT: TMU Hanford

Purchase Order/Project:

DATE: 11.19.02

F# /SOW# / Release #: F03-005

Laboratory SDG #: 0211L177

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvL1 Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	11.19.02 ~~☒ Yes~~	☒ No	☐ N/A	☒ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

#1 Cooler ERC 99-058 = 14.3°C

ERC 99-058 / 14.3°C

ERC FS-002 / 2.4°C

ERC 99-055 / 2.1°C

Laboratory Sample Custodian: D. Johnson

Laboratory Project Manager:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

DATE RECEIVED: 11/19/02 LVL LOT # :0211L177

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B15YL7						
% SOLIDS	001	S	02L%S127	11/14/02	11/20/02	11/21/02
% SOLIDS	001 REP	S	02L%S127	11/14/02	11/20/02	11/21/02
CHLORIDE BY IC	001	S	02LICA80	11/14/02	11/26/02	11/26/02
CHLORIDE BY IC	001 REP	S	02LICA80	11/14/02	11/26/02	11/26/02
CHLORIDE BY IC	001 MS	S	02LICA80	11/14/02	11/26/02	11/26/02
FLUORIDE BY IC	001	S	02LICA80	11/14/02	11/26/02	11/26/02
FLUORIDE BY IC	001 REP	S	02LICA80	11/14/02	11/26/02	11/26/02
FLUORIDE BY IC	001 MS	S	02LICA80	11/14/02	11/26/02	11/26/02
NITRITE BY IC	001	S	02LICA80	11/14/02	11/26/02	11/26/02
NITRITE BY IC	001 REP	S	02LICA80	11/14/02	11/26/02	11/26/02
NITRITE BY IC	001 MS	S	02LICA80	11/14/02	11/26/02	11/26/02
NITRATE BY IC	001	S	02LICA80	11/14/02	11/26/02	11/26/02
NITRATE BY IC	001 REP	S	02LICA80	11/14/02	11/26/02	11/26/02
NITRATE BY IC	001 MS	S	02LICA80	11/14/02	11/26/02	11/26/02
TOTAL CYANIDE	001	S	02LCB89	11/14/02	11/21/02	11/21/02
TOTAL CYANIDE	001 REP	S	02LCA89	11/14/02	11/21/02	11/21/02
TOTAL CYANIDE	001 MS	S	02LCA89	11/14/02	11/21/02	11/21/02
PHOSPHATE BY IC	001	S	02LICA80	11/14/02	11/26/02	11/26/02
PHOSPHATE BY IC	001 REP	S	02LICA80	11/14/02	11/26/02	11/26/02
PHOSPHATE BY IC	001 MS	S	02LICA80	11/14/02	11/26/02	11/26/02
CHROMIUM VI	001	S	02LVI037	11/14/02	11/22/02	11/22/02
CHROMIUM VI	001 REP	S	02LVI037	11/14/02	11/22/02	11/22/02
CHROMIUM VI	001 MS	S	02LVI037	11/14/02	11/22/02	11/22/02
CHROMIUM VI	001 MSD	S	02LVI037	11/14/02	11/22/02	11/22/02
SULFATE BY IC	001	S	02LICA80	11/14/02	11/26/02	11/26/02
SULFATE BY IC	001 REP	S	02LICA80	11/14/02	11/26/02	11/26/02
SULFATE BY IC	001 MS	S	02LICA80	11/14/02	11/26/02	11/26/02
NITRATE NITRITE	001	S	02LN3D85	11/14/02	11/22/02	11/22/02
NITRATE NITRITE	001 REP	S	02LN3D85	11/14/02	11/22/02	11/22/02
NITRATE NITRITE	001 MS	S	02LN3D85	11/14/02	11/22/02	11/22/02
AMMONIA	001	S	02LAMA34	11/14/02	12/02/02	12/05/02
AMMONIA	001 REP	S	02LAMA34	11/14/02	12/02/02	12/05/02
AMMONIA	001 MS	S	02LAMA34	11/14/02	12/02/02	12/05/02
PH	001	S	02LPH093	11/14/02	11/21/02	11/21/02
PH	001 REP	S	02LPH093	11/14/02	11/21/02	11/21/02

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-005 H1977

DATE RECEIVED: 11/19/02 LVL LOT # :0211L177

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFIDE	001	S	02LSD055	11/14/02	11/22/02	11/22/02
SULFIDE	001 REP	S	02LSD055	11/14/02	11/22/02	11/22/02
SULFIDE	001 MS	S	02LSD055	11/14/02	11/22/02	11/22/02

LAB QC:

CHLORIDE BY IC	MB1	S	02LICA80	N/A	11/26/02	11/26/02
CHLORIDE BY IC	MB1 BS	S	02LICA80	N/A	11/26/02	11/26/02
FLUORIDE BY IC	MB1	S	02LICA80	N/A	11/26/02	11/26/02
FLUORIDE BY IC	MB1 BS	S	02LICA80	N/A	11/26/02	11/26/02
NITRITE BY IC	MB1	S	02LICA80	N/A	11/26/02	11/26/02
NITRITE BY IC	MB1 BS	S	02LICA80	N/A	11/26/02	11/26/02
NITRATE BY IC	MB1	S	02LICA80	N/A	11/26/02	11/26/02
NITRATE BY IC	MB1 BS	S	02LICA80	N/A	11/26/02	11/26/02
TOTAL CYANIDE	LCS L	S	02LCB89	N/A	11/21/02	11/21/02
TOTAL CYANIDE	LCS L	S	02LCB89	N/A	11/21/02	11/21/02
TOTAL CYANIDE	MB1	S	02LCB89	N/A	11/21/02	11/21/02
TOTAL CYANIDE	LCS L	S	02LCA89	N/A	11/21/02	11/21/02
TOTAL CYANIDE	LCS L	S	02LCA89	N/A	11/21/02	11/21/02
TOTAL CYANIDE	MB1	S	02LCA89	N/A	11/21/02	11/21/02
PHOSPHATE BY IC	MB1	S	02LICA80	N/A	11/26/02	11/26/02
PHOSPHATE BY IC	MB1 BS	S	02LICA80	N/A	11/26/02	11/26/02
CHROMIUM VI	MB1	S	02LVI037	N/A	11/22/02	11/22/02
CHROMIUM VI	MB1 BS	S	02LVI037	N/A	11/22/02	11/22/02
CHROMIUM VI	MB1 BSD	S	02LVI037	N/A	11/22/02	11/22/02
SULFATE BY IC	MB1	S	02LICA80	N/A	11/26/02	11/26/02
SULFATE BY IC	MB1 BS	S	02LICA80	N/A	11/26/02	11/26/02
NITRATE NITRITE	MB1	S	02LN3D85	N/A	11/22/02	11/22/02
NITRATE NITRITE	MB1 BS	S	02LN3D85	N/A	11/22/02	11/22/02
AMMONIA	MB1	S	02LAMA34	N/A	12/02/02	12/05/02
AMMONIA	MB1 BS	S	02LAMA34	N/A	12/02/02	12/05/02
AMMONIA	MB1 BSD	S	02LAMA34	N/A	12/02/02	12/05/02
SULFIDE	MB1	S	02LSD055	N/A	11/22/02	11/22/02
SULFIDE	MB1 BS	S	02LSD055	N/A	11/22/02	11/22/02

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-005 H1977
LVL#: 0211L177

W.O.#: 11343-606-001-9999-00
Date Received: 11-19-02

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of Sulfide analysis that were performed past hold.

4. The results presented in this report are derived from samples that did not meet LvLI's sample acceptance policy as noted on the Sample Receipt Checklist.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries for Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia, Sulfide and Total Cyanide were within the 75-125% control limits.

8. The replicate analyses for Chloride, Fluoride, Nitrate, Nitrite, Chromium VI, Sulfate, Ammonia, pH, Sulfide, Percent Solids, Total Cyanide, Phosphate and Nitrate Nitrite were within the 20% RPD control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12-12-02
Date

njp\i11-177

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity __ by coupon __ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		✓ 9010B/9014	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		✓ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

Other: Chloride, Fluoride, Nitrate, **Method:** EPA 300.0 (mod.)

Other: Nitrite, Phosphate, Sulfate **Method**

Nitrate Nitrite EPA 353.2 (mod.)

Ammonia EPA 350.3 (mod.)

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1977 LVL LOT #: 0211L177

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B15YL7	% Solids	95.8		%	0.01	1.0
		Chloride by IC	1.3	u	MG/KG	1.3	1.0
		Fluoride by IC	1.3	u	MG/KG	1.3	1.0
		Nitrite by IC	1.30	u	MG/KG	1.30	1.0
		Nitrate by IC	10.6		MG/KG	1.30	1.0
		Cyanide, Total	0.34	u	MG/KG	0.34	1.0
		Phosphate by IC	2.8		MG/KG	1.3	1.0
		Chromium VI	2.7		MG/KG	0.42	1.0
		Sulfate by IC	5.9		MG/KG	1.3	1.0
		Nitrate Nitrite	2.7		MG/KG	0.16	1.0
		Ammonia, as N	2.6	u	MG/KG	2.6	1.0
		pH	8.6		SOIL PH	0.01	1.0
		Sulfide	25.7	u	MG/KG	25.7	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/10/02

CLIENT: TNUHANFORD F03-005 H1977 LVL LOT #: 0211L177
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	02LICA80-MB1	Chloride by IC	1.2 u	MG/KG	1.2	1.0
		Fluoride by IC	1.2 u	MG/KG	1.2	1.0
		Nitrite by IC	1.25 u	MG/KG	1.25	1.0
		Nitrate by IC	1.25 u	MG/KG	1.25	1.0
		Phosphate by IC	1.2 u	MG/KG	1.2	1.0
		Sulfate by IC	1.2 u	MG/KG	1.2	1.0
BLANK1	02LCB89-MB1	Cyanide, Total	0.50 u	MG/KG	0.50	1.0
BLANK1	02LCA89-MB1	Cyanide, Total	0.50 u	MG/KG	0.50	1.0
BLANK10	02LVI037-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0
BLANK10	02LN3D85-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
BLANK10	02LAMA34-MB1	Ammonia, as N	2.5 u	MG/KG	2.5	1.0
BLANK10	02LSD055-MB1	Sulfide	40.0 u	MG/KG	40.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1977 LVL LOT #: 0211L177

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B15YL7	Chloride by IC	28.6	0.79	26.1	106.3	1.0
		Fluoride by IC	27.2	0.44	26.1	102.6	1.0
		Nitrite by IC	26.0	1.30u	26.1	99.4	1.0
		Nitrate by IC	36.7	10.6	26.1	100.1	1.0
		Cyanide, Total	4.76	0.34u	5.24	90.9	1.0
		Phosphate by IC	30.4	2.8	26.1	105.5	1.0
		Soluble Chromium VI	7.7	2.7	4.2	120.6	1.0
		Insoluble Chromium VI	1110	2.7	1010	110.2	100
		Sulfate by IC	32.7	5.9	26.1	102.6	1.0
		Nitrate Nitrite	7.0	2.7	4.7	92.7	1.0
		Ammonia, as N	99.9	2.6 u	102	98.2	1.0
		Sulfide	400	8.3	389	100.7	1.0
BLANK10	02LICA80-MB1	Chloride by IC	24.0	1.2 u	25.0	96.1	1.0
		Fluoride by IC	25.6	1.2 u	25.0	102.4	1.0
		Nitrite by IC	24.6	1.25u	25.0	98.2	1.0
		Nitrate by IC	23.6	1.25u	25.0	94.5	1.0
		Phosphate by IC	24.9	1.2 u	25.0	99.6	1.0
		Sulfate by IC	24.0	1.2 u	25.0	96.1	1.0
BLANK10	02LVI037-MB1	Soluble Chromium VI	4.1	0.40u	4.0	103.2	1.0
		Insoluble Chromium VI	1100	0.40u	1160	94.9	100
BLANK10	02LN3D85-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.0	1.0
BLANK10	02LAMA34-MB1	Ammonia, as N	102	2.5 u	100	102.0	1.0
		Ammonia, as N MSD	104	2.5 u	100	103.8	1.0
BLANK10	02LSD055-MB1	Sulfide	456	40.0 u	471	96.9	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1977 LVL LOT #: 0211L177

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	02LAMA34-MB1	Ammonia, as N	102.0	103.8	1.7

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/10/02

CLIENT: *TNUHANFORD F03-005 H1977* *LVL LOT #: 0211L177*

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B15YL7	% Solids	95.8	95.2	0.57	1.0
		Chloride by IC	1.3 u	2.0	NC	1.0
		Fluoride by IC	1.3 u	1.3 u	NC	1.0
		Nitrite by IC	1.30u	1.30u	NC	1.0
		Nitrate by IC	10.6	10.7	0.83	1.0
		Cyanide, Total	0.34u	0.62u	NC	1.0
		Phosphate by IC	2.8	2.7	5.7	1.0
		Chromium VI	2.7	3.1	15.5	1.0
		Sulfate by IC	5.9	5.9	0.71	1.0
		Nitrate Nitrite	2.7	2.7	1.2	1.0
		Ammonia, as N	2.6 u	2.6 u	NC	1.0
		pH	8.6	8.6	0.3	1.0
		Sulfide	25.7 u	22.9 u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/10/02

CLIENT: TNUHANFORD F03-005 H1977 LVL LOT #: 0211L177
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCSS1	02LCB89-LCS1	Cyanide, Total LCS	1.90	2.0	MG/KG	94.8
LCSS2	02LCB89-LCS2	Cyanide, Total LCS	9.71	10.0	MG/KG	97.1
LCSS1	02LCA89-LCS1	Cyanide, Total LCS	2.11	2.0	MG/KG	105.4
LCSS2	02LCA89-LCS2	Cyanide, Total LCS	9.83	10.0	MG/KG	98.3

Lionville Laboratory Use Only

02IIL177

Custody Transfer Record/Lab Work Request

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI — LIONVILLE LABORATORY INC

Client: TNU Hanford F03-005

Est. Final Proj. Sampling Date:

Project #: 11843-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: Orlette Johnson

QC: SPCC Del: 5(1) TAT: 30 45 days

Date Rec'd: 11-19-02 Date Due: 12-19-02

	A	B	C		D			E		F	G
Refrigerator #	1	4	4		4			4		4	4
#/Type Container — Liquid											
#/Type Container — Solid	1ag	1ag	1ag		1ag			1g		1ag	1ag
Volume — Liquid											
Volume — Solid	60	250	250		60			170		500	60
Preservatives	—	—	—		—			—		—	—
ANALYSES REQUESTED	ORGANIC: TCL VOA	BNA (1)	Pest PCB	Herb	Alcohols Glycols Ketones			INORG: TCP Metal (2)	CN	IC (3) Anions	pH
Lionville Laboratory Use Only	0624H	0825X ODRO	OPCB		OGESC			METO TCR		INORGO	IPH

MATRIX CODES:
- S - Soil
- SE - Sediment
- SO - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Drum Solids
- DL - Drum Liquids
- L - EP/TCLP Leachate
- WI - Wipe
- X - Other
- F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	A	B	C		D			E		F	G
001	B15YL7	X	X	S	11-14-02	0939	X	X	X		X			X		X	X

Special Instructions:

DATE/REVISIONS:
- MET ① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Al, Be, Bi, B, Ca, Cu,
- 2. Fe, Mg, Mn, Mo, Ni, K, Na, Tl, V, Zn, Hg
- INORG ① 3. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4
- 4. IN3N2, INH3N, ISFD, ICNTO
- 5.
- 6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # see below
2) (Ambient) or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 14.3 °C

Relinquished by	Received by	Date	Time
Fed Ex	D. Arnold	11-19-02	0910

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

7912 3430 5074/2.1° 7912 3430 5030

7912 3430 5052/2.4°

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-005-011	Page 1 of 1

Collector R. Nielson	Company Contact Steve Trent; Telephone No. 373-5869	Project Coordinator TRENT, SJ	Price Code 8N; Data Turnaround 45 Days
Project Designation 200 Area Source Characterization 200-CS-1 OU - Waste Man	Sampling Location SP-1	SAF No. F03-005	Air Quality ☐
Ice Chest No. SEE 05PC	Field Logbook No. HNF-N-3251; COA 117514ES10	Method of Shipment Federal Express	
Shipped To ~~EBERLINE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No. A030 030	Bill of Lading/Air Bill No. SEE 05PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG	~~G/P~~ aG RN 11/13/02
No. of Container(s)	1	1	1	1	1	1	1	1	1
Volume	60g 60ml	250g 250ml	60g 60ml	250g 250ml	125g 120ml	500g 500ml	60g 60ml	1000g 1000ml	500g 500ml
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions. [lined out, 11/18/02]	Nickel-63; Technetium-99; Tritium - H3 [lined out, RJN 11/13/02]

Sample No.	Matrix *	Sample Date	Sample Time									
B15YL7	SOIL	11-14-02	0939	X	X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature] R. Nielson	11-14-02 1320	REF# 1B 3728	11-14-02 1320
~~SJGALE [signature] 111802~~	~~111802 1100~~	~~[illegible]~~	
REF 1B 111802	1100	SJGALE [signature]	111802 1100
SJGALE [signature]	111502 1100	FED EX	
FedEx	11-19-02 0910	[signature]	11-19-02 0910

SPECIAL INSTRUCTIONS

** Please see SAF for specific sampling instructions.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Sulfides - 9030; Total Cyanide - 9010
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Radium-226, Radium-228, Sodium-22, Tin-126}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Strontium-89,90 -- Total Sr; Carbon-14; Neptunium-237; Total Uranium; Americium-241; Americium-241/Curium-244 (Add-on) {Curium-242}

Personnel not available to relinquish samples from the 3728 Ref # 1B on 11/18/02

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TMU Hanford

Purchase Order/Project:

DATE: 11.19.02

SAF# / SOW# / Release #: F03-005

Laboratory SDG #: 0211L177

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	11-19-02 ☒ Yes	☒ No	☐ N/A	☒ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 99-058 / 14.3°C

#1 Cooler ERC 99-058 = 14.3°

ERC FS-002 / 2.4°C

ERC 99-055 / 2.1°C

Laboratory Sample Custodian:

Laboratory Project Manager: